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Audubon, the American Woodsman

The life of the great artist-naturalist whose anniversary is being celebrated this month

By EDWARD A. PREBLE

Illustrated by Jex

A HUNDRED and fifty years ago, on the beautiful tropical island of Santo Domingo, was born a child who was destined to become the most famous of American naturalists. Spurred on by an ardor for the study of Nature that drove his strong body to almost superhuman labors, and possessed of talents that mark him as a genius, he produced works that brought him unending fame, and wielded an influence in popularizing ornithology that increases with the years. This was Jean Jacques Audubon, better known as John James Audubon.

In the preparation of this sketch, the author acknowledges his indebtedness to "Audubon the Naturalist", by Francis H. Herrick, who, by his masterly presentation of the results of years of patient research, has earned the gratitude of all students of the life and work of the great pioneer.

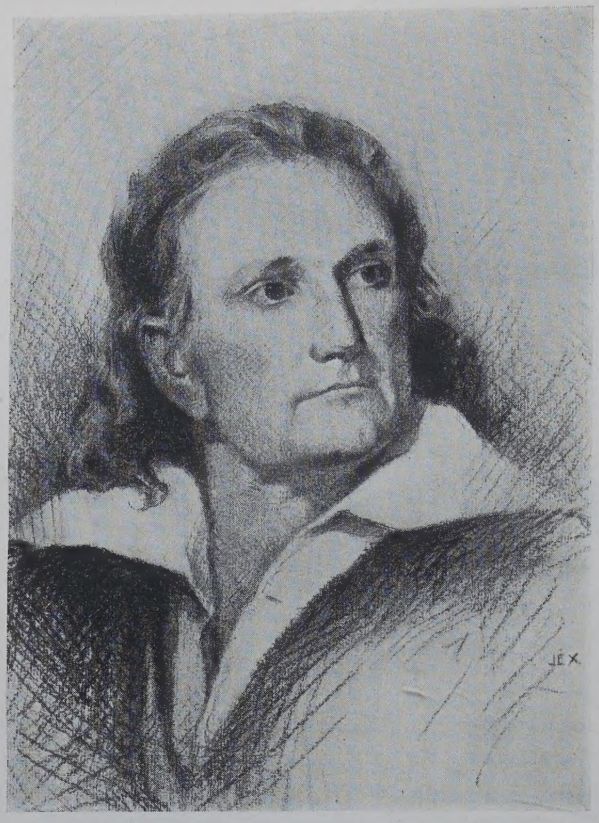
Jean Audubon, the naturalist's father, had a notable and picturesque career as soldier, sailor, planter and merchant. He was from the Vendean section of France, a place that produced many a fearless and capable man. Following the fall of Louisburg in 1758, where, a mere boy, he was wounded and captured with the rest of his father's crew, he spent five years in British prisons. Again, in 1779, while on one of his many trips to Santo Domingo, voyages that in those days of war and piracy called for ability of the highest order, he was captured by the British in West Indian waters, after a gallant defense against overwhelming odds, and was held a prisoner in New York for thirteen months. It is not surprising, therefore, that he had no love for Britain or her institutions, and that we find him in command of one of the French ships that cooperated with the land forces of the revolting colonists at Yorktown on October 19, 1781.

For several years following, Jean Audubon spent most of his time in the West Indies, where he amassed a fortune. Here at Les Cayes, Santo Domingo (now Haiti) Jean Jacques Audubon was born, on April 26, 1785. Little is known of his mother, who was described by his father as a "creole of Santo Domingo" and is now known only as Mlle. Rabin. At the time she was in poor health, and she died about a year later. She must have had a generous measure of beauty, and it is altogether likely that her son owed to her some share of the artistic genius that, combined with the courage and determination he inherited from his versatile father, accounted for his final triumph.

In 1772, during one of his brief stays at Nantes, his home port, Jean Audubon had been married to a widow, Anne Moinet Ricordel, kind of heart and cultured, qualities that later were to be very helpful to the young naturalist. When he finally returned to France in 1789 he presented his wife Anne with his son Jean, then about four years old, and a daughter Muguet, or Rosa, about two. Madame Audubon, who had no children, welcomed these brought to her with a kindness that never failed them, and four years later they were legally adopted. Mrs. Audubon is stated to have been very proud of her handsome foster son, and the boy's affection for her was genuine. Through the stormy years of the century then closing young Audubon and his sister, as far as the records show, were in her care in Nantes.

Jean Audubon had cast his fortunes on the side of the revolutionists of his native land. Following a term as special commissioner he served on, or commanded, several vessels that successfully engaged British privateers. When, in 1801, the outbreaks in Santo Domingo had almost impoverished him, he retired to a country place at Coueron, and passed the remainder of his life in gratifying a passion for raising fruits and flowers, and in attending to the remnants of his interests in Nantes.

For a few years young Audubon, under the indulgent care of his foster mother, whom he later called "a true



JOHN JAMES AUDUBON

mother", was receiving such instruction as the disordered condition of the country dictated. There is much evidence, however, that the banks of the Loire yielded him treasures for his pencil that in his mind far eclipsed the products of formal schooling. Although the elder Audubon did not discourage his son's passion for Nature and drawing, he planned for him a business career, and on one occasion, snatching him from the indulgent hands of Madame Audubon, he placed the boy in a school where he could better be kept under supervision. But after about a year of duress the future naturalist is found back at his bird-nesting. This lack of early schooling was a severe handicap when, in middle life, he wished to write for publication on the wild birds he loved.

In 1803 Jean Audubon, fortunately for the cause of science, decided to send his son to America, under the care of a business partner, that he might learn English and some form of business. Years before, while on a visit to Philadelphia, he had purchased an estate of nearly 300 acres on the banks of Perkiomen Creek, near its junction with the Schuylkill, in Pennsylvania. The place was named Mill Grove, and there was a mill, a mansion, and many outbuildings. It was not the father's intention that his son should go to Mill Grove, but one of the more fortunate of the strokes of destiny that shadowed the young man led him to the place, and here he spent a part of 1804 and 1805, revelling in its wild treasures. Here he marked with silver wire a brood of phoebes that had been raised in a tiny cave, and started the science of bird-banding. There were many other adventures, but it was not until the hunting season of 1804 that the young naturalist made what was to prove his greatest discovery. A chance encounter in the grouse covers made him acquainted with a neighbor, William Bakewell, and led him to visit the home of the older man. Let young Audubon tell it: "It happened that he was absent from home, and I was shown into a parlor where only one young lady was snugly seated at her work by the fire. She rose on my entrance, offered me a seat, and assured me of the gratification that her father would feel on his return, which, she added, would be in a few moments as she would dispatch a servant for him. Other ruddy cheeks and bright eyes made their transient appearance but, like spirits gay, soon vanished from my sight; and there I sat, my gaze riveted, as it were, on the young girl before me, who, half working, half talking, essayed to make the time pleasant to me."

Audubon at this time was a youth of fine appearance, and endowed with a measure of strength and activity that made him a favorite in all social and athletic gatherings of young people. His suit prospered, but his father, who did not wish him to marry while so young and before he had acquired a means of livelihood, had written to his business partner to dissuade the young man from taking such a step. But before a reply could come, young Audubon appeared in person, having decided, for his own reasons, to visit France. He reached there in the spring of 1805, and returned to America about a year later, having spent the intervening time in his usual pursuits, which in this case included the drawing of all the birds he could procure—"very bad, to be sure," he said, "but still they were of assistance to me". During this period Audubon greatly benefited by the close companionship of the naturalist Charles M. d'Orbigny.

The current state of affairs in France impelled the elder Audubon to get his son safely back to America, to avoid the danger of conscription. He reached New York late in May, 1806, in company with one Ferdinand Rozier, with whom a business partnership had been arranged. Among the projects that they hoped to develop was a lead mine at Mill Grove, and a few days later young Audubon was back there, and with his sweetheart. On the advice of his future father-in-law, he did not rely entirely on the immediate concerns of the new partnership, but took employment in the office of a brother, Benjamin Bakewell, in New York. Here he remained about a year, but there is evidence that the value of his bird study probably exceeded that resulting from his attention to business.

In the late summer of 1807 Audubon and Rozier crossed the mountains to Kentucky, and opened a store at Louisville, and though both the Bakewell interests and his own were in hard straits because of the virtual stopping of exports to France and England, he soon returned to Pennsylvania for Lucy Bakewell. They were married on April 8, 1808, at the Bakewell home, and at once started back to Kentucky, where they arrived in due course, after an adventurous journey by coach and flatboat.

It would require a volume written by a master hand to do justice to the beneficent influence of Lucy Bakewell on Audubon's life and work. It is not too much to assert that without her it is virtually certain that the world

had never known his name. For more than forty years, until his death in 1851, she was ever at his side in person or in spirit, but long periods found them far separated. For months at a time Audubon would be in the wilderness hunting birds, or abroad superintending the printing of his plates or preparing his text, or traveling in search of subscribers. At such times she was the homekeeper and usually the bread-winner. Whatever the verdict of others, *she* never lost faith in his ultimate success and always used her talents and energies in taking care of their children, by earning money as a teacher, so as to leave him as free as was practicable to follow his cherished plans.

But we are ahead of our story, for at this early period Audubon seems to have had no notion of publishing any important work on birds; he merely loved to study them, and draw their pictures. It is probable that a meeting with Alexander Wilson at Louisville in the spring of 1810 was the starting point of a determination to publish. Neither had ever heard of the other, and both were equally astonished when their drawings of birds were compared. When Wilson approached Audubon for a subscription, there was evident jealousy, but Audubon invited his rival on a hunt, and showed him some birds unknown to him. Wilson died three years later, but their differences, whatever they were, continued to be fostered by Wilson's friends, and to Audubon's injury.

The business of Rozier and Audubon soon languished; as the latter admitted, business abandoned him. There were other enterprises and partnerships, notably with his brother-in-law, Thomas W. Bakewell. There was a mill at Henderson (Audubon called it "that accursed mill"), the ruins of which stood until 1894. At this period his chief pleasures probably came on the long journeys by horseback across the mountains. He admits that on occasion he forgot the treasures of goods and gold on the packsaddles in the joy of studying a rare warbler. His business ventures seem to have finally ended in 1819 when he was committed to jail for debt, obtained his release by declaring himself bankrupt, and walked from Henderson to Louisville without a dollar. About this time the life of the Audubons was further darkened by the death of two young daughters.

For the next few years Audubon was by turns portrait painter, taxidermist, tutor, swimming master, sign painter; to help support his family he resorted to whatever activity lay in his power. But these were only a part of his labors; he journeyed down the Mississippi and lived for some time at New Orleans, St. Francisville and Natchez; then back to Shippingport and Louisville in Kentucky, always studying and drawing birds. In 1824, at thirty-nine, he visited Philadelphia in an attempt to bring out a work that should utilize some of the results of his observations and drawing of twenty years. Here he met many naturalists then, or later, famous: Bonaparte, Peale, Ord, Le Sueur, Harlan, Say and others. However, he received little encouragement to publish, and had only some offers of cooperation from those who were willing to profit by his talent. Thence he went to New York, where he saw his old friend Mitchell, and wrote two

LUCY BAKEWELL AUDUBON

papers on birds (his first); thence to Niagara Falls, Pittsburgh and back to Louisiana. Here he found that Mrs. Audubon had prospered during his absence and was anxious to help him to take his drawings to Europe. This course was decided, and when, after a year's teaching of music, drawing and dancing, he finally sailed from New Orleans in May, 1826, he had supplied himself with a goodly sum of money and many letters of introduction from prominent men in America. Mrs. Audubon and her son, John Woodhouse, remained at St. Francisville; the other son, Victor, was in Kentucky.

Audubon arrived safely in Liverpool with his collection of precious drawings, which he had determined to publish as the Birds of America, and soon was soliciting subscriptions, though he had not yet written a line of text. But he soon set about supplying this lack. In the intervals between his work of superintending the engravings, when this work was started, and his other activities, he wrote long and full accounts of the subjects of his drawings. Referring to an extensive paper on the habits of the wild pigeon he said that he was so completely transported to the woods of America that "his ears were as if really filled with the noise of their wings!" This state of mind doubtless explains why he was able to accomplish so much, for he was sadly homesick for his beloved America and his wife and children. London, he says, seemed "like the mouth of an immense monster, guarded by millions of sharp-edged teeth".

We must pass over the details of his efforts to accomplish the engraving of his plates, and of his many friendships with famous European naturalists. His residence in

Europe covered most of the period from 1826 to 1839. He returned to America in the spring of 1829 and the next spring went back to Europe, this time accompanied by Mrs. Audubon. They returned in 1831, and the naturalist spent about three years in explorations of the north and south Atlantic coasts. In the spring of 1834 he again, with his wife and one son, went to Europe; in 1836 both his sons were assisting him in obtaining subscribers there, and at another time all the Audubon family toured the Highlands of Scotland. But all this time the work of publishing was going on. In 1838 there appeared in London the fourth and concluding volume of the *Birds of America* (life-size plates of 489 species). In 1839 the fifth volume of the *Ornithological Biography,* the text describing the birds that were figured in the larger work, in part edited by William MacGillivray, was issued in Edinburgh.

PASSENGER PIGEONS

From Audubon's plate, *per* Mershon. The great naturalist was privileged to observe this species in such abundance that he did not believe that its numbers could ever be sensibly diminished. The last one died twenty years ago and the fate of the species serves as a solemn warning

While these great works were being published, Audubon, in 1832, worked on the coasts of Maine and New Brunswick, and in South Carolina and Florida. While on his way to Florida he stopped at Charleston, where he met the Rev. John Bachman, who insisted that the party stop at his home. A month of cordial friendship and cooperation followed before Audubon was obliged to leave on the government schooner that had called for him. Although he found in Florida a number of birds that were new to him, many delays and disappointments occurred, resulting in part from the necessity of accommodating his visits ashore to the movements of a government boat. But he had met Bachman, with whose collaboration he later issued a work on mammals that is a lasting monument to both men.

A desire of long standing to visit the coast of Labrador was consummated in the summer of 1833. He was accompanied by his son John (Victor was in Europe), and three other young men. The name of one of them, Thomas Lincoln, was given to an undescribed sparrow taken near Natashquan River. Audubon was so absorbed in his drawing, which was done mainly aboard ship on account of the stormy weather and the lack of shelter elsewhere, that he could spare little time for any other field work. His zeal to do justice to all the new subjects—ptarmigan, the northern breeding shore birds and their downy young, and the cliff-breeders—drove him to work each day to the point of exhaustion. He complained that he was growing old too fast—when, after working from three in the morning until half-past five in the afternoon, he could no longer hold the pencil—"yet work I will, and may God grant me life to see the last plate of my mammoth work finished", he wrote. We quote from his journal of July 2: "All—all is wonderfully grand, wild—aye, and terrific, and yet how beautiful it is now, when one sees the wild bee, moving from one flower to another in search of food, which doubtless is as sweet to it, as the essence of the magnolia is to those of favored Louisiana. The little Ring Plover rearing its delicate and tender young. . . . I watched the Ring Plover for some time; the parents were so intent on saving their young that they both lay on the rocks as if shot, quivering their wings and dragging their bodies as if quite disabled. We left them and their young to the care of the Creator. I would not have shot one of the old ones, or taken one of the young for any consideration, and I was glad my young men were as forbearing". Yet, of course, Audubon had found it necessary, in order to identify the species and to describe and picture the many plumages, to take specimens in large numbers on many occasions. Happily, now that the pioneer work of the earlier naturalists has settled many of the problems that then vexed them, it has become less necessary to take life, even in the cause of science. Today, many questions of migration and of plumage sequence are being answered, more surely than by the older means, by banding and re-trapping, a method in which Audubon was, almost accidentally, a pioneer.

In 1842, Audubon's family was at last established at a new home on the Hudson, near what is now Riverside Drive, and which now (it is hoped) is in the process of re-establishment as a shrine to the naturalist and his gracious wife. Dr. Bachman was at work on the text of the joint work on quadrupeds. Audubon now began serious plans for a cherished expedition to the Missouri region, and in March, 1843, the party started by stage and boat for St. Louis. In a small steamer belonging to a fur company, they ascended the Missouri as far as Fort Union. Here the party worked from early June to mid-August, Audubon writing and painting and his companions collecting the birds and mammals, of species then

little known: Cranes, waterfowl, bison, deer, antelope and wolves. At Fort Union, in the late summer, the party built a serviceable boat, and floated back to St. Louis. Home in the east was reached early in November.

Sprague's Pipit and Bell's Vireo, first discovered on this journey, were named for his companions of the trip. Harris's Finch (which he supposed to be new, and whose summer home was not discovered until nearly sixty years later) he dedicated to a close friend; while Baird's Finch was named for the young naturalist, S. F. Baird, whose wish to accompany the expedition had been echoed by Audubon. His voluminous notes taken on this journey, after having been used by Bachman, were lost for more than fifty years, but finally came to light in an old desk, and were published by a grand-daughter in 1898.

The Missouri journey, as Audubon had foreseen, was his last one. Following his return he did some further drawing and writing, but he soon had to relinquish to Bachman, and to his son, the work of completing the "Quadrupeds". His mental powers began to ebb in 1847, though he remained in comparatively vigorous health until near the end. He died on January 27, 1851.

Lucy Bakewell Audubon passed many years of mental and physical activity after the death of her husband. In her seventieth year she again took up teaching in a small way, having as pupils some of her numerous grandchildren and a few others from the neighborhood. Among her scholars was George Bird Grinnell, father of the Audubon Society, who thus links the Audubonian period with the present. A portrait taken when she was about 83 shows that she still retained to a singular degree the sweetness of expression that in 1804 had captivated at first sight the young and dashing cavalier.

Mrs. Audubon died on June 13, 1874, at Shelbyville, Kentucky, at the home of her sister-in-law, Mrs. W. G. Bakewell. Her ashes rest beneath the monument in Audubon Park, New York City, beside the remains of the most picturesque of all those who have studied America's birds, John James Audubon, whose life she so signally enriched, and whose fame she made possible.

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On Western Trails, Again

WOULD you like to follow the trails into the mountain fastnesses across the Jackson Lake? Would you like to make camps in some high valley and mountain canyon and spend a week roughing it away from civilization?

Members of the American Nature Association parties that followed the trails in the back country of the West in 1929 and 1930 have been urging another trail trip. The Grand Teton National Park has been suggested, since it is exclusively a trail park. So we have gone into the details, and if there is enough interest a party will leave Chicago on August 3 for Grand Teton National Park, Wyoming. It will enter the Park by pack train, carrying full equipment and spend seven days moving over the trails by easy stages and camping in the high country. A naturalist will accompany the party.

Returning to Moran, Wyoming, the party will return East by way of the Grand Canyon of the Yellowstone, where there will be a night's stay, and Cody, Wyoming. This trip will be run on an absolute cost basis, and is being proposed only to give members of the Association a chance to spend an exhilarating vacation with like-minded fellow members. Any members interested may obtain full information as to plans and costs from Richard W. Westwood, Chief of Editorial Staff, Nature Magazine, 1214 Sixteenth St., Washington, D. C.

A SPECIMEN OF FASCIATED ASPARAGUS
This odd garden question mark is a result of this curious freak of Nature in which plants join together

That Strange Thing Called Fasciation

By LESLIE L. HASKIN

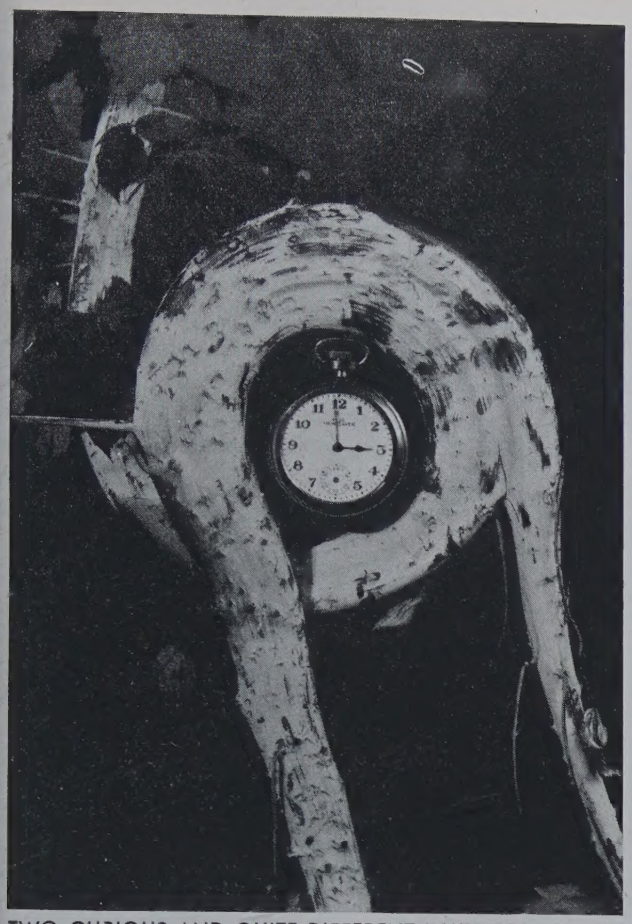
Photographs by The Haskin Studio

WERE you ever astonished while looking over your garden on some fine spring morning to find among your tulips one plant with two, or three, or even four blossoms growing upon the top of a broad, flat stem; or two pansy faces growing together, joined back to back; or, perhaps, a lily that has grown up on a stem, broad and flat as a lath, and with a great packed head of numberless blossoms, twice as many as any normal lily should bear? Have you ever in your walks through woods or fields found some weed, or bush, or vine that towered to twice its normal height, or spread to twice its normal girth, and that was twisted, and branched, and covered with bloom having an abnormal number of parts, or perhaps some of them thickened and fleshy, looking more like a grotesque head of cauliflower than like a normal bloom? If you have noticed any of these things you have undoubtedly seen that strange freak of Nature that the botanists call fasciation. This word comes from the Latin *fascis,* meaning a bundle, for in these plants it appears as though a number of independent twigs had somehow become bound together in an inseparable union. The whole might be compared to the fasces—that bundle of rods that the Roman lictors bore before the magistrates as a mark of authority.

Fasciation in its more simple form is a not uncommon deformity, and attracts little attention. In its more complex manifestations it becomes a grotesque wonder, and a marvel to the botanist as well as to the layman. Its commonest form is perhaps that seen in the familiar cockscomb. Here is a garden flower in which fasciation has been encouraged by the growers until it has become hereditary, so that we no longer wonder at seeing the top of the plant spread out in the form of a broad, crimson crest, but take it as a matter of course. What would you think, however, should some great tree near your home suddenly begin to take on such a crested form? One such tree grows in a park at Beecroft, Australia, an Australian pine whose joined and broadened branches form a great woody "cockscomb" nearly thirty feet in height. If this tree continues to grow and thrive as it has in the past, what may it not become? Some Australian pines reach a height of over two hundred feet!

PLANTAIN GOES ALL AWRY
A strange triple fasciation in this common weed. Note the effect on the stem

In some cases fasciation is confined to the fruit alone. This is especially common in apples, and in the fruit of the Italian prune, grown so largely on the Pacific Coast. Here, upon one stem, you will find a double fruit; a fruit joined solidly from base to blossom, or joined only at the base, and having two distinct apexes. In picking strawberries, too, you may often encounter a double berry and won-



TWO CURIOUS AND QUITE DIFFERENT INSTANCES OF FASCIATION

At the left it has brought about a strange curving and branching in a living black-cap raspberry. At the right is a fasciated lily with broad lath-like stem and crowded multiple blossoms

der whether it is the product of one blossom or two. When next you find such a fruit, look at the stem and see if it is not broad and flattened. If it is you may know that here is a true case of fasciation. Fasciation in nuts has been given a place in the folk-lore of lovers in the age-old game of *philopena,* "much-loved". The game is usually played by a youth and a maiden upon the finding of a nut with two meats within an apparently normal shell. Each lover then eats one of the meats, and when they meet again some penalty—usually a kiss—is exacted of the one who forgets to utter the endearing word. Such double meats are frequently the result of partial fasciation.

When stems are fasciated, there is often a typical twisting or curving habit of growth that is most interesting. How this twisting comes about is easily explained. What happens when two horses firmly hitched together start to run away, and one of them goes with twice the speed of the other? Almost at once you will see them begin to travel in circles, and the greater the disparity of speed the smaller will those circles be. So it is when two stems of diverse growth are unalterably fasciated together. The

WHAT! FASCIATION

Thick stem, monstrous terminal bloom and more than thirty auxiliary branches instead of the usual simple growth

one that grows most rapidly will soon be running in circles about the other, and thus a twined, or curving growth ensues. If the variation on growth is extreme, the resulting curves may become so short and abrupt that the very fibre of the plant becomes ruptured, and the stem actually breaks itself from the violent wrenching of its tissue. Just what peculiar form the curves in a fasciated plant may assume depends on how many potentially separate stems are thus fasciated, and the varying rates of each one's growth. Some become tapering spirals; some run in regular loops, like a coiled spring, and some make such close turnings that an actual tube is the result.

Still more curious are those forms of fasciation in which it seems that instead of a binding of parallel stems, there is an actual blending, one within another, of many stems. In the first form the flowers and leaves, while greatly increased in numbers, nevertheless appear normal in all their parts. In the second form the parts themselves are merged, and then we have the curious sight of a normally five-parted bloom having, instead, ten, twenty, forty, or, finally, an almost innumerable number of petals, stamens, or pistils. In some cases so many parts may be blended that the whole bloom becomes a mere fleshy tubercle, without any recognizable organs. Only one rule can be laid down as to the form that extreme fasciation may take. That is that it will be quite different from anything that you have previously seen.

What causes fasciation? That no one fully knows. One thing is plain. It bears a somewhat close analogy to the bearing of twins, and "Siamese twins", among animals. A bulb or root may be stimulated by an excess of fertility in the soil, or by some other cause, to start a number of new plants by natural division. In some way, however, the division is never fully completed, and from the heart of that plant a monster is born. This might be called healthy fasciation. In other cases disease has some part in the process, and gall mites are supposed to be a contributing cause. As is well known, the sting of gall mites causes an abnormal growth in the surrounding tissue. The stem begins to swell, as in the case of a normal insect gall. Then, perhaps, the plant partially overcomes the poison, and instead of a restricted, normal gall there appears a number of partially joined, monstrous branches that cause the passer-by to marvel and to exclaim.

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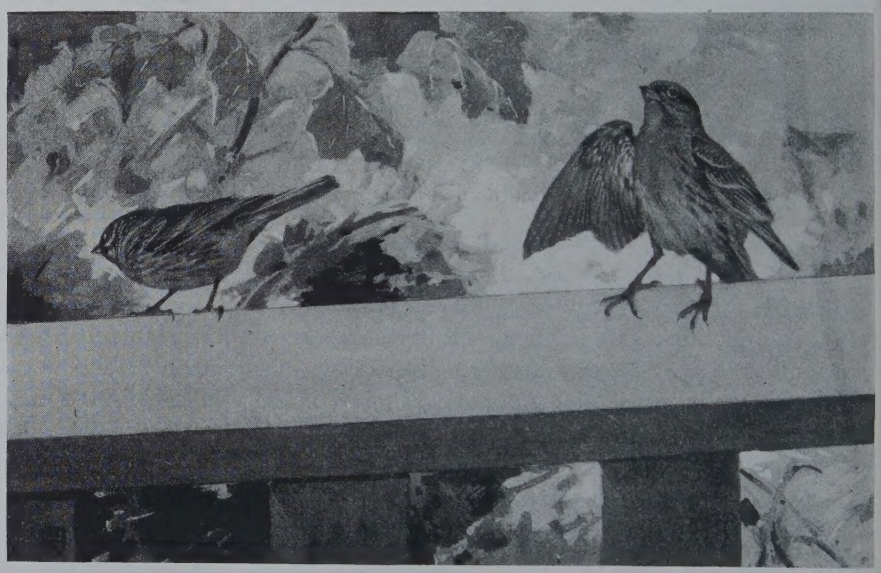
SPRINGTIME IDYLL

By ADA CLAPHAM GOVAN



ALL THROUGH the winter I wondered whether I should ever again be allowed to see the most ethereal, fairy like scene of all my close experience with the little feathered friends —the courting dance of the purple finches. The dance took place within four feet of my window, on May 7, and went through without interruption, from start to finish. My only previous experience with the finches had been a rather unfortunate one.

On April 26, I saw two birds light on a feeding station and pick ravenously amongst the seeds. Their garments hung about them in gory tatters—or so it seemed to my startled eyes. My first thought was that they had been peppered with bird shot. But when two brown, sparrowy birds dropped down beside them, I realized that I was entertaining four purple finches, and great was my disappointment. I had read about their beauty, but to me they looked like nightmares. I did not at that time take into account how ragged may be a moulting bird.

I shall never forget the gallant little figure that met my eye on the May morning. There he stood—my little Sir Galahad—clad in shining raspberry satin, with waistcoat of pale rose shading into silver, and with dusky wings of bronze that he furled and unfurled like a flowing scarf. With all the fervor of a brave and devoted heart he danced before the one of his choice. On the very tips of his long, slender toes—looking like a gigantic butterfly—he floated nearer, ever nearer, to his heart's desire. And she? Just as he was about to claim her as his own—she turned her back! With calloused cruelty, she hopped away and left him standing there! But his was the heart of a gallant lover. With undiminished ardor he danced for fifteen ecstatic minutes, before the demure brown damsel at the other end of the railing consented to be his bride. Bill locked with bill, shoulder touching shoulder, thus they stood for a moment, facing the world together before they flew away on their honeymoon. A whirr of fast flying wings and they had disappeared; but the exquisite beauty of the scene will stay with me down through the years.

SUCCESS, AT LAST, AFTER MANY FAILURES TO GET SAGE CHICKENS

One of a number of the birds that are destined to change their voting residence from Wyoming to New Mexico to found a new sage chicken dynasty in that Southwestern State

CHICKENS OF THE SAGEBRUSH

By ARTHUR NEWTON PACK

THE sage chicken is the largest of American grouse. He differs in many ways from the prairie chicken, and ranges farther westward, making his home wherever the sagebrush grows in sufficient density to afford him food and shelter. Mottled in combinations of blue-gray, black, brown and white, he may hide safely under any sage bush and so blend into his background that neither hawk nor hunter can discern his presence until within a few feet, and then only with a sharp and well-trained eye.

Sage chickens once roamed and flitted over a vast area between the great plains and the Pacific Coast, but, like so many other interesting birds and other animals, have fallen prey to a human rapaciousness readily stimulated by appetite for a toothsome meat which is more than a mere delicate morsel. From many of their former haunts the birds have vanished completely, and many conservationists have felt that nothing could be done about it. Now they have been proved wrong, at least in one instance.

Readers of Nature Magazine may recall articles in former issues by Mr. J. Stokley Ligon, of Carlsbad, New Mexico. Mr. Ligon was for a time with the Predatory Animal work of the United States Biological Survey, engaged in studying the habits of wolves and evolving means of getting rid of those predatory creatures, which positively could not be fitted in with advancing civilization; but, when the main part of the wolf work was over, Mr. Ligon found himself at variance with the Survey's policy toward continued destruction of other predators. He had made a study of game birds of various kinds and, upon his retirement from the Survey, set up a game farm for breeding and sale of pheasants, quail, and grouse. He found that certain wild species, such as sage chickens, would not thrive or breed in captivity on a practical basis. Yet the Fish and Game Commission of his state was anxious to procure some sage chickens, in order to reestablish them in the areas of northern New Mexico which they had formerly occupied. With infinite patience, he set

OFF TO NEW MEXICO
The captured birds were placed in boxes to be transported to a new range where they will be protected

to work on the problem of trapping and transporting wild birds, and is probably the only man in the country who has found a solution of the sage chicken problem.

In Wyoming sage chickens are still found in considerable numbers, but Wyoming wanted to establish various other kinds of quail and grouse, and wished, also, to experiment with wild turkeys. The Game Commissions of both states being progressive and friendly, and New Mexico possessing what Wyoming wanted, as well, a trade was arranged. One October day I received a wire from Mr. Ligon, saying that if I wanted pictures of this unique wild bird trapping experiment, I could meet him on the Shoshone-Arapahoe Indian Reservation near Lander, Wyoming, the following Tuesday. Probably, also, my airplane would be useful for quick transportation of the captured birds, just as it had been for the antelope, as described in Nature Magazine.

Sage chickens, when they have not been intensively hunted, generally walk away from a moderate disturbance rather than flying away—that is, *if* the weather isn't too hot and *if* they don't happen to be in a hurry, and *if* they intend to feed by the way, and *if* it's the way they want to go, anyhow. Those are the factors for the expert to determine, if he can. Those are the "ifs" which demand a lot of patience in dealing with all wild animals.

The first thing Mr. Ligon does is to locate the birds, by driving slowly and observantly about across the sagebrush slopes in an automobile. If he finds the birds, the next thing is to set up his trap ahead of them and usually a little above them. Birds don't like to fly down-wind; they often don't like to work against a setting sun; they are full of whims and practical instincts.

The trap proper is made of fish-net cord and is about twelve feet long by four feet wide and four feet in height. At one end is a slightly funnel-shaped entrance. In front of this is a similar cage of chicken wire, also with a funnel-shaped front, and from either side of its entrance extend wire or fish-net wings, about eighteen inches high and looking for all the world like an overgrown ping-pong net stretching out sixty feet on either side to form a V, perhaps one hundred feet across the open end. The outfit is contrived to be as portable as possible, but, of course, takes time to set up.

With the trap ready, Mr. Ligon and I would get into his camp truck and cautiously circle around behind the birds—that is, if they hadn't changed their minds and flown away while we were getting ready. Now comes the rub. By driving back and forth very slowly behind the birds, one must disturb them just enough to get them to leave their sunning or their eating and walk towards the trap, which is out of sight, if possible, but not much more than a hundred yards away. The birds may be in bunches of fifty or more, but it is best to try to cut off about a dozen at a time, as too many will increase the chances of some one old cock deciding to fly away. If he does, all the rest are almost sure to follow.

All sportsmen and Nature lovers alike delight in the thrill of the close approach and the imminent chance of success or failure. Sage chicken trapping possesses all the seeds of excitement.

Back and forth, back and forth our car bumps along. If the birds seem too nervous the only thing to do is to back up at once. Foot by foot, we gain ground, foot by foot the straggling birds progress towards the wings. Now we can actually see the trap. Look! Three or four old birds have seen the netting in their path! If we can only turn them, so that they will follow it down! Go on, you hen. Lead the way in! Darn it! She is suspicious. She's turning back. This is the crucial instant, for, if the leaders hesitate, the flock will start milling around and then—! A whir of wings—it's all over! Right on the verge of success, one bird flies and all the rest follow. As they flap over the hillside, twenty—thirty—forty more sage chickens rise to follow. Laboriously we pull up all those stakes, roll up the nets and prepare to look for another bunch.

I don't know how many sets we made near Fort Washakie. We learned that the Indians were accustomed to shoot what birds they wanted right from their wagons or cars, and, as a result, these Reservation sage chickens

AN UNGUESSABLE BIRD

The sage chickens are easy to catch if they do not decide to take to wing for a variety of good reasons

were vehicle-shy almost as much as they were pedestrian-shy. After three days, the boys from the Jicarrilla-Apache Indian Reservation in New Mexico, who had brought along a truck load of carefully made boxes to take their share of birds home, were a bit discouraged. Besides, they had broken no less than three springs, bumping across the sage-brush. The third night we gave it up and started for Casper. There was a game refuge near that city, and perhaps the Commission would allow us to try these tamer birds. Mr. Scott was most friendly and cooperative. "Go ahead," he said.

From that time on, the story changed. On our first drive we missed only because my camera blind was probably too near the trap and the birds didn't have time to get used to it. Bright eyes that see a hawk afar can detect a strange tube of metal projecting through a sage bush. We made a second drive without even having to move the trap. One—two more—three—seven—twelve, in all, they followed one unsuspicious leader through the first tunnel and on into the cage. Mr. Ligon rammed his car across the mouth of the trap, and all I had to do was to take pictures as he transferred the big captive birds to their boxes.

It wasn't so hard, when you found birds that weren't too wild. Gradually, all those boxes filled. New Mexico will have sage chickens again.

And let us all hope that she will take care of them.

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The Lowly Sandlily

By ETHEL MARY BAKER

TOO OFTEN, in searching for the more brilliant, conspicuous flowers native to our woods and fields, we lose sight entirely of the gracious little beauties that hug close to the ground, or nestle tight against some friendly, protecting rock. Perhaps one of the most unpretentious, as well as one of the most beautiful of these lowly ones, is the sandlily, *Leucocrinum montanum*. When several are grouped together on a bare slope like miniature drifts of snow, they make an imposing picture, but to appreciate a lone specimen, one should humble himself enough to bend a knee.

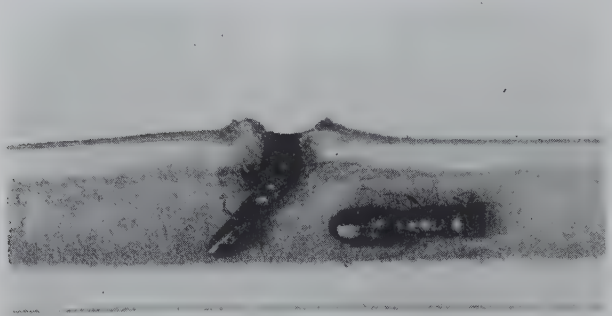
The starry white flowers that look as though they might have been dipped in some magic crystal, with a blob of butter-yellow stamens in the center, spring out of the rosette of blue-green, stiff and narrow leaves, somewhat after the manner of our garden crocus. Yet, it is not a bulb flower, for it has thick, fleshy roots. When transplanted to gardens—and they are especially effective in rockeries—they require good drainage, a rather sandy soil with a fair amount of humus and plenty of sun. They are perfectly hardy and well-grown specimens will often yield as many as forty or fifty perfect star-like blossoms, while the smaller clumps will, of course, have less. In late summer the plants die down, but reappear in early spring.

Colobopsis

An ant of interesting habits

By ROSS ELLIOTT HUTCHINS

A SOLDIER IN THE QUEEN'S GUARD
The picture is enlarged to show the curiously shaped head used to plug the entrance to the home



A SOLDIER ON DUTY AT THE HOLE
A white ash twig split open. In such a twig the queen has laid the foundations of her colony

A LIVING DOOR AT THE ENTRANCE
Enlarged view of the twig showing the soldier's head which closely resembles the tree bark

A TREMENDOUS responsibility has Mother Colobopsis. Spring is at hand and a new colony is to be founded and cared for until able to shift for itself. The ants are among the most intelligent of insects and Mother Colobopsis is no exception. With hurried and restless movements she runs up and down twigs and peers into crevices, searching, always searching. Now she stops to sip honey dew from a docile plant louse, and again to explore a hole deserted by a boring beetle. Never for once, however, does she forget the business in hand and continues her apparently aimless wandering, always with that same careless care.

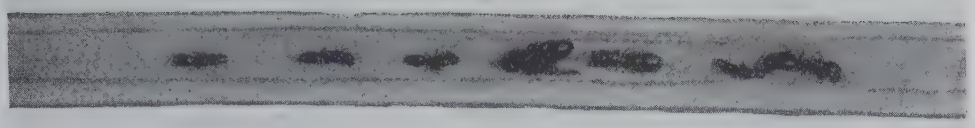
At last she seems to have found a white ash twig which deserves more than her usual consideration, and she selects a spot near its middle and begins to gnaw away the bark. Certainly this is not an ant-like procedure, but she goes to work as if she were instinctively accustomed to it. For a while she labors diligently and then wanders about over the chosen twig as if further to check up on its desirability. But all seems well, and each time she returns and gnaws at the hole until it is large enough to receive her brown body, which is hardly more than a third of an inch long.

After entering the twig she continues downward through the soft pith, until, after several days, she has progressed several inches. At this time she seems satisfied with her undertaking and rests quietly in the burrow. Like Romulus and Remus she has founded a feudal city and there only remains to sow the seeds of its future inhabitants. This she does in the form of many small, white eggs. While the tiny embryos are developing into future workers and soldiers to guard and carry on the work of the colony, she rests from her labors and feeds upon sweet honey dew, which to Mother Colobopsis and her family is the staff of life.

One balmy day the eggs begin to hatch into small, worm-like creatures which rest on the soft pith lining the burrow. Mother Colobopsis once again takes up her labors and strives to gather enough honey dew in her body to feed the rapidly developing young. This is a critical time for the colony for if some bird should find her while out foraging that would be the end of it. But all goes well, and as the days pass the babies grow into squirming larvae almost as long as the mother. They are white and spindle-shaped, smaller at one end than the other. Gradually they become inactive and then a strange thing happens. They go to sleep into the deep sleep of *transformation*. Many days pass and the mother guards the small round hole of the burrow, while interesting changes are taking place in her children. Beneath the

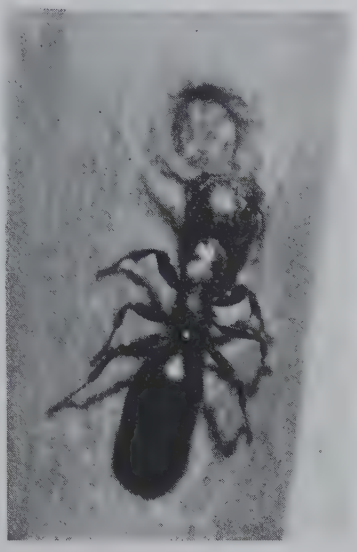
INSIDE THE COLONY WITH WORKERS, SOLDIERS AND THE QUEEN

Below, a returning soldier seeks entrance to the colony



skins of the young ants, legs, antennae and other parts become visible and after a time fully grown ants crawl forth. The colony is founded, the uncertainties of its feeble beginnings are over.

There are two other kinds of ants besides the mother or queen now. There are workers to gather honey dew from the plant lice and scale insects and to enlarge the tunnel as the colony increases in size. There are also soldiers with ridiculous plug-like heads to guard the colony against intruders. Like the drawbridge of a feudal castle one of the soldiers keeps its head in the entrance at all times forming a living door. The eyes and antennae of the soldiers are far back so that there is nothing protruding for an enemy to grasp. On the other hand when a member of the colony returns home it merely taps in a certain way on the head and is admitted at once. This guard is changed at long and irregular intervals.



Inside this portal the colony thrives and enlarges its tunnel both above and below the hole. Sometimes two entrances are made and for some reason one of these may be sealed over. How like a feudal castle isolated in a vast wilderness of enemies, secure behind closed gates which admit only friends, identified by knowledge of the password.

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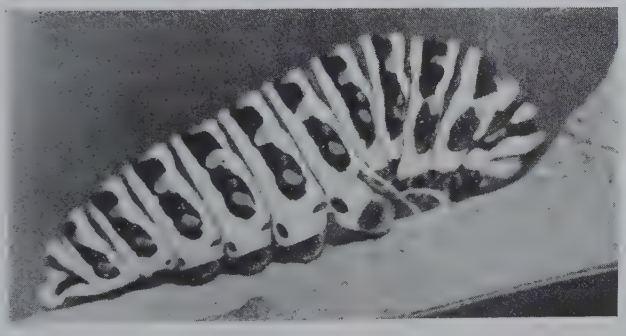
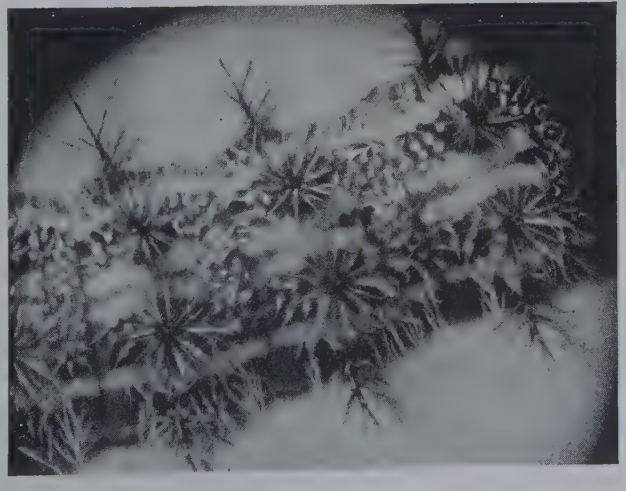
Protected from Their Enemies *By* LEWIS WAYNE WALKER

AMONG our common insects we have several that rely on either disgusting odors or armor for protection from their enemies. The caterpillar of the swallow-tail butterfly depends on a nauseating smell which he emits when danger is near. This comes from two yellow flexible horns which he can thrust out from his head at will. I remember when I first added some of these creatures to my insectary for study, I thought these yellow protuberances were a form of antennae raised to catch sound or scent, but when I touched them with a pencil the origin of a mysterious odor was discovered. It was revolting to me, and it must be horrible to the overly-delicate senses of birds, and so tends to make them leave this caterpillar strictly alone.



POLECAT AND PORKY OF INSECTDOM

The caterpillar of the swallow-tail butterfly protects himself with a bad odor, and the other covers himself with spines to discourage enemies



On a branch of sage I came across a caterpillar that utilizes the porcupine method of protection. He was black and seemingly covered with a soft fur until I picked him up. The fur was as stiff as needles, just as sharp, and barbed in the bargain. Later examination with a microscope disclosed the fact that each hair had many branches, and resembled tiny pine trees in shape.

Both these peculiarly protected caterpillars are open and aboveboard in their mode of living. They are not at all secretive, and do not rely on protective coloration for safety. Like their large mammalian counterparts, the skunk and porcupine, they realize that Nature has made it possible for them to be bold.

The Home Ties of Chickadees

By OLGA LAKELA

THE LONG-TAILED CHICKADEE
Banding these birds established interesting facts about their home life

DO THE chickadees of the long-tailed western subspecies remain in the same locality throughout the year or not? That was the question for which I was seeking the answer when I banded fourteen of these cheery little fellows near Minot, North Dakota, and when, next spring, I found a nesting pair, I hoped I was close to settling the matter. These birds had chosen an abandoned woodpecker hole on an island in an ox-bow lake cut off from the main channel of River Souris. So, as June arrived, two Boy Scouts, floating a ladder beside the canoe, ferried me to the island, helped me place the ladder against the tree and left me, a willing exile, for the day.

The nest was about twenty feet from the ground. Climbing up to the lowermost limb, I raised myself to the one above it which brought me to the level of the nest on the opposite side of the trunk, around which I could easily reach. It seemed that the chickadees had made the particular choice for my convenience. No tree sitter was ever more comfortably located than I was in the crown of the sunlit elm, thinly shaded by bright growing leaves, and braced by the prairie winds. The chickadees still alarmed by the placing of the ladder and by my unwanted presence, flew about and scolded convincingly. Quietly following their movements I became conscious of the difference in their calls; the pitch in the notes of one being lower than that of the other. Since avian males are sopranos, as a rule, I concluded that the alto was the female. Without color distinction between the sexes the discovery was of a tremendous significance, because it relieved my fears of capturing the same bird twice.

From time to time the birds disappeared into the thicket to return with beak-loads of food; green measuring worms, pinched in the middle while their prehensile ends squirmed for freedom; brown and white-striped Haploa moths, plump and hairy to tickle the avian palate. From the heart of the elm next to my own came the hunger cries of the young. The adults too wary to attend to the brood, repeatedly, either ate the food or dropped it, and flew after more. Hearing the cries of increasing distress, I became anxious. Will they feed the young? Their safety for the moment gave me greater concern than getting my record.

For two hours the parent birds flitted about; for two hours the young called, and I waited. Then one flew in; the female, I decided, from the mellow notes of response to the burst of glad twittering. Was she the braver parent? I thought she was telling the dear ones how she had to dodge the human monster, parked in the rear of their dwelling and determined to worry them to the point of starvation. Quickly I placed a hair net over the hole, and waited with breathless expectation. With an outward flutter the bird was in my hands. Recording the number, B51156, from the band, I recognized it as one of my series. The bird lay submissively in my firm hold; the black eyes watched me; the open bill did not scold. Why the change in behavior? In slipping the bands around the slender legs I had been scolded, and my fingers had smarted with sharp, tenacious nipping. Was she hurt? I trembled in cutting the net loose from the claws and the wings. She was free in my opened hand, and posed for a moment on my finger as if to decide which direction to take. Flying to a nearby branch, she shook her feathers, and chattered; in a moment she was gone and I was thrilled.

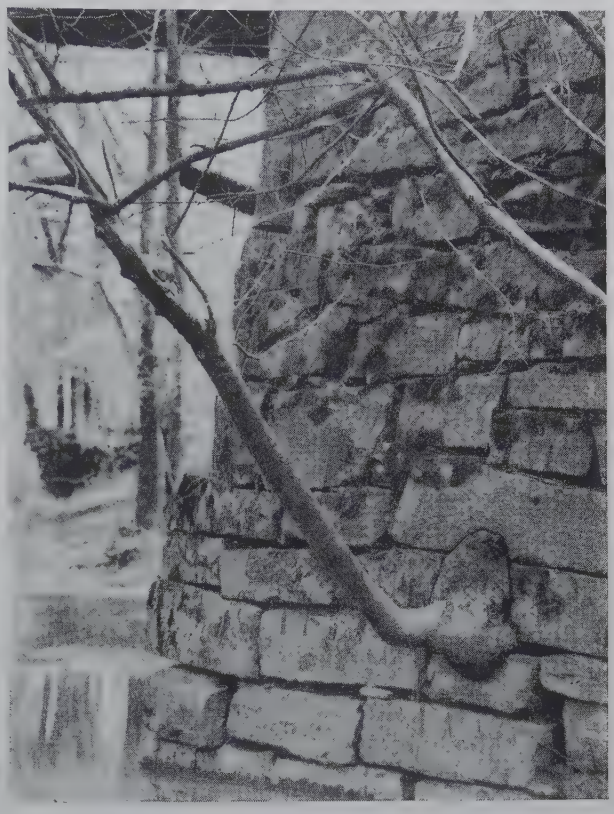
Before I had time to compare my records, the other flew in, and was received by the same burst of joy. The notes of consolation told me that it was the father, as I had hoped. Naturally he would follow the mother. Holding another net over the hole I tried to justify my intrusions into the life of this family, so perfect a social unit, toiling, protecting and loving to fulfill the purpose of Nature. For some unnamable reason they seemed to belong to me. Proudly I recalled all the pounds of suet and nuts which I had provided for them during the past five winters; and the hours of enjoyment I had spent watching them on my window ledge or in trees, pecking, tasting, flitting and chattering, ever cheerful and confident. What did they care if the snow blew and the winds raged? There were holes in the trees and a storehouse on the window. They ate and sang and were caught in my trap. In another moment the father chickadee was in my hands without resistance. Perhaps they remembered my touch; their fearlessness made me glad. Making the record I was amused to note the band number, B51157 was the next higher to that of his mate. Quickly

I freed him, and he disappeared into the thicket of Juneberry below.

Satisfied at the success of my enterprise, I hurried down the ladder. Each parent visited the nest as if nothing had happened. Comparing my records I was further amused to note that I had banded the birds on two successive days during the previous November. The recovery contributed a record to ornithology to prove that this pair of chickadees lived winter and summer in the particular locality. And I had a glorious time proving this.

A Tree Goes in for Engineering

By WILMER T. FOX



A UNIQUE illustration of the adaptability of plant life to unusual conditions in its environment is found in the base of the sycamore tree growing at right angles from a bridge pier near LaGrange, Kentucky. Shortly after this tree reached a diameter of an inch, either the shearing effect of gravitation or the upward swing in heavy winds would have snapped it off close to the pier. Without any knowledge of engineering, the tree spread out a broad base, forming a truss with a compression member to overcome downward and lateral pulls. It also sent roots upward through the vertical seams between the masonry thus forming the tension members of a truss. It is doubtful if any tree rooted in the soil is more effectively anchored against all the stresses and strains the elements can exert.

Perhaps primitive man, by noting how nature had taught the tree to build against the force of the winter winds, first learned to plan effectively his own simple structures.

(Left) A GROUP OF ELEPHANTS ON THEIR PARENT PLANT SPIKE
At the right are three of the little heads detached and two leaves showing the ferny appearance.

The Little Red Elephant

By ANNA L. NEWSOM

Photographs by C. R. Walker

IF, WHEN hiking in the Rocky Mountains at an elevation of ten to eleven thousand feet, you come upon a herd of little pink elephants, do not become alarmed, and think that all is not well with your eyes—or your mind. Of course, these elephants will not be walking slowly in a row, as elephants often do. They will be clinging to a tall green spike, which rises from a plant growing near some trickle of water, its roots sinking into the soft, wet leaf mold.

Elephantella groenlandica—alias Little Red Elephant, alias Elephant's Head—is a member of the snapdragon family. It is much better named than most of the wild

flowers because the tiny blossoms are perfect replicas of tiny elephants' heads—even to the eyes.

The leaf is ferny, a deep, rich green, in beautiful contrast to the pinkish-purple of the blooms. The plant grows from one foot to eighteen inches tall, and its blooming season, at an altitude of ten thousand feet, is from the last of June until the last of July. At slightly lower altitudes the plants may bloom a little earlier, but they will be scarce and shorter below this altitude. The specific name of this interesting plant indicates one extreme of its extensive range; from Alaska southwardly to the high mountains of New Mexico and California.

Leaf Models

By GEORGE A. SMITH

LEAF models made from plaster of Paris and painted in natural colors will be useful in identifying the trees of a community, and will make attractive display material for Nature Study groups, especially Boy Scout organizations.

To make such leaf models, purchase a pound of ordinary white modeling clay. Roll out the clay on a smooth surface with a rolling pin or a round bottle. Cut out a rectangular section of the clay just large enough to fit into a cardboard box lid of a size large enough to make the leaf model. Place the leaf specimen, with the under side down, on the clay, and press it into the clay with a piece of glass cut for this purpose. Then carefully pull the leaf out of the clay without disturbing the impression.

Measure out enough plaster of Paris to make a layer on top of the clay approximately one half of an inch thick. Mix up the plaster of Paris with clean cold water, and pour it into the mould. Have the mixture thin enough to flow freely into the mould. The mixture will set in a few minutes, therefore it will be necessary to use it as soon as it is mixed up. Shake the box lid gently to level off the top of the cast, and to eliminate the air bubbles. Let the cast dry a half of a day, then remove the cardboard and pull off the layer of clay. The leaf form will now appear in relief with the veining accurately shown.

To add to the naturalness of the model, paint the leaf with green water color, and the stem with a shade of brown that matches the specimen. The name of the tree may be printed below the leaf with India ink or black water color. To add to the durability of the model and to prevent the plaster of Paris from dusting, paint the entire cast with clear shellac or varnish.

The same clay can be worked over in making any number of different models.

The many applications of such an idea to school and Scout work are plain, and it is fascinating as a means of making a collection.

PLASTER LEAVES

Prepared in this way and painted the proper colors, such models make excellent display material

In "Sequoia" the motion picture industry has made a notable contribution to wildlife conservation. Here is a beautiful and gripping story of the wild, superbly filmed. We earnestly urge every individual and group interested in the outdoors and our wildlife to ask their local motion picture theatre manager to schedule a showing of this outstanding Metro-Goldwyn-Mayer picture. There have been a number of wild animal films with varying merit, providing entertainment and thrills, some of these synthetic. "Sequoia", however, is GREAT, and we owe a debt to those who have produced it and who have thus given us the finest wildlife conservation motion picture ever shown.

BUNNIES BY CY LA TOUR

MAGNOLIAS BY D. W. BOYER

Signs of Spring

Spring Flowers

With the coming of spring there comes also those floral harbingers of the season of birth and growth, the early wild flowers of field and wood. One of the earliest spring plants is the skunk cabbage, usually the first plant to flower, a citizen of the low, wet woods, meadows and swamps. Photograph by B. L. Brown. Beside it is the dogwood, which brightens the woods even before most of its trees are in full leaf. Photographed by E. L. Crandall. At the left is the ill-scented wake robin or purple trillium with its flower of deep maroon. Photographed by L. W. Brownell.

On the opposite page, at the top, is the pasque flower, the State Flower of South Dakota. Photograph by B. L. Brown. Next to it is the Indian pipe, fragile and ethereal plant of the moist, rich woods. Photograph by B. L. Brown. Below, at the left, is the narrow-leaved spring beauty, one of the earliest of the spring flowers. At its right is the windflower or wood anemone, a plant of the moist or low woodlands, which gives us its solitary flowers in April or May.

The Jungfrau, famous queen of the Bernese Oberland Alps of Switzerland, seen from the vicinity of Interlaken.

Anna and Her All-Electric Home

A photographic record made by George A. Lewis

For eighteen successive years a little Anna hummingbird, ***Calypte anna,*** has raised her family in a tiny nest attached to an electric light cord on the front porch of Judge William D. Dehey of Independence, California. Returning each year, the mother hummer first sets about house cleaning. Then she builds a new addition atop the old, which is carefully left for her. This accumulation of nest material, which consists of thistledown, willow cotton and lichens, has continued through the years. Now the nest extends about six inches above the light globe.

Sitting tranquilly on her two tiny eggs, this midget mother is undaunted by the curious visitors and photographers which her unique loyalty to this nesting place has brought to see her. During the period of incubation nothing can force her to relinquish her duties. In fact, once during the eighteen years the residence was partially destroyed by fire but she went right on with her family duties despite the confusion.

Once that the lazy but extremely exacting days of incubating the eggs are over, the problem of feeding two small but exceedingly hungry children keeps the mother bird continually on the go. Returning at regular intervals of about twenty minutes, she taps one of her babies on the beak as a sign that dinner is ready. She always finds a willing diner.

The rapid growth of the youngsters soon taxes the capacity of the nest. Their constant preening and stretching might have led to danger did not the mother tie them in. Human mothers who tie their babies in a crib to keep them from falling out may have gotten the idea originally from the hummingbird. As soon as the young birds have grown to a point where there is danger of one being pushed out of the nest, the mother weaves one foot of each baby to the side of the nest. Closely examined, this bond is found to be so cleverly done that while it accomplishes its purpose, it does not bind or cut off circulation.

Because the young hummers are not able to walk, belonging to the great group that fly directly from the nest, they must be strong of wing before they leave. By providing this anchor, the mother assured safety for the babies in their practice at "ground flying" and the vigorous exercise of their wings, which was indulged in frequently during the last few days in the nest. Each day or so the binding is removed, the young shifted in the nest and the binding replaced on the other leg.

The baby hummers were almost as large as their mother when they were released from their anchor. For a few minutes after the first young bird had flown the other youngster seemed to enjoy the luxury of the nest to himself. Then he launched himself into the world, leaving the nest empty and forlorn.

A world of sunshine and flowers awaits the young hummers. The mother continues to feed them for a few days and then they make their own way. They delight in chasing one another up and down the woven wire fence and giving the shrill piping song characteristic of the Anna.

YOUNG MR. COYOTE DROPS IN FOR TEA

Photograph by Lorene Squire

Some Common Insects

Photographed by Frank Triem

The white marked tussock moth, ***Hemerocampa leucostigma,*** is the best known and least liked of its family. It annually causes thousands of dollars' worth of damage to shade trees, being abundant and a voracious eater. It is, nevertheless, a striking insect in its larval form. In the inset is the male photographed by Brownell.

Below is ***Grapta interrogationis*** or the question sign. By some stretch of the imagination one is able to see the question mark made by the silver spots on the under side of the hind wings. Here the larva is shown at rest on the under side of an elm leaf. The butterfly hibernates through the northern winter and may sometimes be found in January or February comfortably sheltered in hollow logs or under the eaves of buildings.

The striped morning sphinx, *Celerio* or *Deilephila lineata,* affects, in the caterpillar, two styles of dress. One of these is yellowish green with a series of connected spots along each side of the back, these being colored crimson, yellow and black. The other style is black with a yellow line down the middle of the back, and yellow spots of various sizes along the sides. The one shown here is the former coloring. It feeds largely on purslane. The moth itself is shown in the inset.

The tomato sphinx below, *Protoparce sexta,* is the larva that causes grief to tomato and tobacco growers, being a heavy eater on their vines. It is green with yellow or orange-yellow markings and often grows to four inches in length. The specific name *sexta* refers to its markings, which are six in number. It is also known as *Protoparce carolina.* The moth is pictured in the inset.

The caterpillar above is commonly known as the pearly wood-nymph and by the scientific name of *Euthisanotia unio*. It is a small but showy fellow often found on both wild and domesticated grape vines throughout the middle west. It is burnt orange, banded and dotted with black. The moth, which is shown in the inset, is lavishly ornamented with white, straw-yellow and deep brown.

The cabbage-butterfly larva shown below is an undesirable alien introduced into this country. It does serious crop damage, feeding on a variety of cruciferous plants but preferring cabbage. There are three broods a season. The adult butterfly, shown in the inset (photograph by L. W. Brownell), is a familiar sight above the cabbage patches of Iowa, Illinois and adjoining states. A cabbage head infested with the larvae soon becomes a sorry spectacle since the appetite of the insect is large.

The curious looking creature above is the larva of a night-flying moth commonly known as Harris's three-spot, *Harrisimemna trisignata* Walker. It feeds on winterberry and lilac. The name comes from the beautiful markings on the wings of the adult moth. Below is the painted picta, *Mamestra picta,* commonest member of a large family. Below is *Pholus achemon* in person. It is commonly called the achemon sphinx. In this picture he is shown with his head retracted. Note how demurely he folds his three pairs of auxiliary legs under his set of chins.

Early Birds

Spring brings with her to the northern climates the birds, many of whom set quickly about the important business of selecting a home site and building a nest. Bird lovers will be on the lookout for the early birds and watch their work of raising a family with avid interest. The spirit of the nesting bird seems to be summed up in the picture of the mourning dove on her nest above, as snapped by a photographer of the Canadian National Railway. At the right, Nature photographer L. W. Brownell has caught a yellow warbler busy feeding her young. Below we see the great-crested flycatcher, one of our allies at keeping insects in check, getting dinner while on the wing.

Here Mr. Brownell gives us a sextet of birds; at the left a mother robin trying to decide which to feed first; above the talented singer, the hermit thrush; at the right a house wren approaching the entrance of her nest; below, at the left, that bit of the sky, the bluebird; below a group of young chickadees whose parents may have been coming to the feeding station all winter; and, at the bottom of the page, the song sparrow. These are a few of our valuable song birds, valuable not only for the joy they bring and the interest they arouse, but for their great work in eating insects and thus helping to keep our gardens free of the hungry pests.

Introducing Honest John Dowitcher in person, an undemonstrative fellow and the bird photographer's delight, so willingly does he pose. He feeds in the muck of tide flat or on the margin of sluggish lagoon, and is equipped with a beak the tip of which is slightly enlarged and flexible, that he may detect and capture his food from beneath the ooze. He is a first cousin of the jack snipe on his maternal side and about the same size. He winters in the south from Florida to the West Indies and Brazil, and nests within the Arctic Circle, a spring and autumn migrant. Photograph by William Leon Dawson.

Four more of our early birds are shown here. Above a group of young yellow-bellied flycatchers seem in serious or hungry mood when they are snapped by the camera of Cordelia J. Stanwood. At the left L. W. Brownell has come upon, and captured on film, a female blackbird at the nest. At the bottom of the page Mr. Brownell has photographed a phoebe and young. This bird is the earliest of the flycatcher family to desert the south and seek the northern regions and set up spring housekeeping. At the right is the lark sparrow, a fascinating and uncommon early arrival. Its comparative rarity in many sections makes it much sought by bird students. Photograph by F. R. Flickinger and L. D. Hiett. Now is the time to prepare a welcome for our bird friends with bird houses properly placed and a bird bath on the lawn or in the garden for summer baths.

★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

A CLOSED SEASON: NOW OR FOREVER ★

Without doubt the most important and most controversial conservation issue before the American people this year will be a closed season on migratory waterfowl. More than two years ago we declared that such a course must be followed if the dwindling species are to be saved from extinction. During the climatically disastrous years that have followed we have repeated the demand. We repeat it once more—there *must* be a closed season for migratory waterfowl for at least this year.

How may a closed season come about? The Secretary of Agriculture is charged with the duty of determining "when, to what extent, if at all, and by what means" migratory birds may be taken. To serve as an intermediary between the Secretary, who is charged with the protection of the birds, and the hunters, who wish to shoot them, it has been the custom for the Secretary to appoint a committee, which is known as the Advisory Board. To this board are submitted suggestions for the provisions that shall govern the annual regulations, based on information gathered by the Biological Survey on the status of the bird population. The board discusses the matter, and submits to the Secretary, through the Survey, its recommendations. With these in hand, the Secretary drafts the regulations, which, with the approval of the President, become effective, and are announced by Proclamation.

During 1934, with drought conditions prevailing in many of the formerly populous duck breeding areas, Jay N. Darling, Chief of the Biological Survey, sent trained men into important sections in the United States and Canada. Their evidence was alarming. They reported that the ducks, their numbers already seriously reduced by overshooting, could not sustain a long season. So a thirty-day season (which, however, was lengthened by "rest days" to three and a half months in some states) was recommended to the board, and was promulgated.

The ducks came from the North, their thinned ranks reflecting past shooting seasons and adverse seasonal conditions. Many hunters came home with empty bags. Others were more fortunate, and the ducks, fewer still, continued on their way. The season was disastrous enough, however, to convince the true sportsmen among the duck hunters that something was seriously amiss. They began to believe that Mr. Darling had been right when he said that if we did what was best for the ducks we would have a closed season.

But there had been a marked demand in several of the states for just this thing, though when the time came for a show-down none of them would lead the way, and all shot thirty days on some terms. During the shameful season far-sighted individuals and organizations the country over, including the Permanent Wild Life Protection Fund, the Emergency Conservation Committee, the American Nature Association, the National Association of Audubon Societies, and many sportsmen's groups, clearly sensing the seriousness of the situation, sought aid for the waterfowl by bulletins and special articles urging either the abolishment of shooting or of some of the unduly destructive methods. The National Association of Audubon Societies advocated a closed season, declaring that "whatever the differing beliefs of individual conservationists, outdoor enthusiasts, sportsmen and others may be as to the principal causes of such extraordinary decline, the fact remains that control of killing of waterfowl by man is the only means we have of quickly contributing to the restoration of an adequate breeding stock." The Biological Survey expressed similar views.

Then came the American Game Conference meeting in New York. From no few sportsmen and some game commissioners came words in favor of a closed season. From more game commissioners, concerned about their jobs, which are dependent on hunting licenses, came doubts. From Illinois, concentration point on one of the major flyways of southbound ducks, came protests against a closed season. From Maryland, another concentration point, came more protests.

The resolutions committee of the Conference considered a resolution from the Audubon Societies for a closed season and shelved it in favor of leaving the question to Mr. Darling of the Biological Survey. Brought to the floor, a resolution for a closed season showed that the support of sportsmen and game commissioners had evaporated, and the proposal was defeated, although by no means ignominiously.

In the meantime Congressman Berlin from Penn-

sylvania has introduced in Congress a resolution for a closed season, with a provision for funds to enforce it. We believe that this is not the way to decide the issue. Mr. Berlin's move is appreciated and the debate of his measure, if it is brought to debate, should be illuminating and provide helpful publicity. But the issue should be decided under already constituted authority, and on the basis of proved scientific fact, not on the basis of partisan politics.

We believe that the evidence of this past year is sufficient. We believe that every sincere sportsman will recognize the facts. We hope that the resolution of the American Game Conference, pledging support to Mr. Darling in whatever regulations he may ask, is not a matter of mere words and an attempt to evade the issue. We hope that every conservationist and every sportsman who is worthy of the name will face the issue and make sure that this year we shall have what we should have had last year—a closed season in the interests of the future of our migratory waterfowl.

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MASSACHUSETTS LEADS THE WAY ★

Conservation and restoration of the beauty of the rural countryside of the United States is given tremendous impetus by the sweeping decision of the Massachusetts Supreme Court against the billboard industry. Declaring the billboards subject to regulation because they offend against good taste and fitness; because they ruin scenic beauty and property values; because they endanger safe highway travel through distraction of attention, the Court shows the way to other states. The decision upholds regulations that impose a license fee sufficiently large to drive small tree, fence and post signs off the countryside, that eliminate sign-smeared barns, and that require set-backs of billboards in proportion to size, thus minimizing their value as advertising media. These rules are in the public interest.

In the light of this decision an opportunity faces the billboard industry. On past performances there is little prospect that it will seize—or even see—the opportunity. According to the organized billboard industry, rural signs represent only five per cent of their total billboard space. Yet they are even now lobbying in the Massachusetts Legislature to draw, by legislative action, the teeth of the Bay State law. This is typical of their past lack of vision. It ignores the growth of public resentment against rural billboards. It reflects an inability to see that they are jeopardizing the whole value of their medium by thus swimming against the current. The billboard industry can cooperate to keep advertising, big and little, off the rural landscape. If it does not it will find itself even more seriously and generally restricted in placing its signs.

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QUAIL AND CLOSED SEASONS

In discussion of a proposal to open the quail season in certain counties in Missouri, where it has been closed, the statement is made that in Ohio a series of closed years resulted in fewer quail than were present at first. Then follows a reiteration of the time-worn argument about the farmers becoming uninterested, and the stock becoming deteriorated by breeding, and the beneficence of hunting.

In 1933 there were published in the *Ohio Journal of Science,* Volume 33, pages 1-18, by S. Charles Kendeigh, of the Baldwin Research Laboratory, the results of an impartial study of the bobwhite in the state, including a careful estimate of the numbers from 1908 to 1931, which included the 19 years during which shooting had been outlawed.

The data considered included populations based on census records, climatic factors, natural enemies, inbreeding, and recuperative powers. There were fluctuations in abundance, but in general there was a steady increase, the numbers in 1931 being more than five times those of 1913 when hunting was closed. As to the bad effect of inbreeding, none was found, and the author quotes Aldo Leopold, game management authority, writing in 1931: "There is not a shred of real evidence that quail inbreed if unshot, or that it would hurt them if they did."

Further, basing his findings on careful study by scientific methods, the author concludes that, although the bobwhite has increased greatly under protection, the number present in 1931 was not sufficient to justify a general open season throughout the state; that had hunting been allowed from 1926 to 1928, the species would have been exterminated; and that the number of quail available for shooting from 1928 to 1931 would have allowed only about two and one-third birds each hunting season for each of the 400,000 licensed hunters in the state.

It seems as if the time had come for the hunters of quail, and for those who serve as their spokesmen, to inform themselves as to facts, rather than to repeat, parrot-like, the time-worn fables of the propagandist. And especially so since the best information that has been gathered on the actual ability of the quail to withstand hunting has been gathered by men paid by the sporting interests to make the necessary studies.

HABITAT GROUP SHOWING THE NOW EXTINCT LABRADOR DUCK

Friends of wildlife are wondering whether anything can be done to save many species of ducks and geese, overshot by gunners every year, from becoming merely museum exhibits.

We are Confused!

American Game Conference leaves us in doubt about who owns our wildlife

WE ATTENDED the twenty-first annual meeting of the American Game Conference in New York, and we are confused. Our confusion arises from the discovery that the wildlife of America belongs to a comparatively small segment of our population—those who are interested in it in order that they may kill it. Naïvely, perhaps, we had regarded wildlife as a natural resource; the property of all the people.

During the first day's session of the Conference, which is called by the American Game Association, which, in turn, describes itself as "North America's Oldest International Wildlife Organization," we listened to a long list of papers by scientists. These men had been engaged in studying wildlife from many angles. From their papers we gathered the inference that the depletion of our wildlife resources is due to many causes, from sunspots to acute indigestion. In our innocence, we thought that the wildlife had been depleted mainly by hunting.

Our mystification got an early start as we listened to a member of the staff of the United States Bureau of Biological Survey. He described the manner in which the ducks follow certain definite routes on the way South. Some of them even come all the way across North America to follow a certain route. Much as the airplane follows a beacon course, these birds converge into definite but unmarked pathways of the air. It was fascinating. Then this gentleman said that the Bureau is confronted by "the administrative problem of providing equal privilege to sportsmen all over the United States." It was then that we got the first inkling as to just who it is that owns all these ducks—or what is left of them. We thought that the Biological Survey's responsibility was the perpetuation of an adequate quantity of wildlife.

We heard talks showing that draining of marshes for mosquito control had deprived ducks of breeding ground; that shortage of eel grass had complicated life for birds that feed on it; that the problems of existence confronting quail, pheasants and ruffed grouse were many. These were frequently interesting papers by men who had carefully and conscientiously studied our game birds in an effort to discover what man might do to repair the damage done by extensive and intensive shooting. Much of the work on which these men have been and are engaged is financed by sportsmen, and the sportsmen present listened interestedly to the stories that showed how much they were doing for wildlife. The scientist, who knows most about our remaining resources of wildlife, we said to ourselves, is coming into his own. Perhaps there is some hope!

On the second day of the Conference there was a waterfowl symposium. Hoyes Lloyd, Supervisor of Wildlife Protection of Canada, painted a black picture of the duck situation in Canada, where breed eighty-five percent of the ducks and geese shot in the United States. Generally, he said, there were fewer ducks breeding and fewer ducks bred. Some species, notably the redhead and the black, were growing scarce. There is little that is cheering in the 1934 reports from Canada, he asserted.

Mr. Lloyd was followed by Jay N. Darling, Chief of the United States Bureau of Biological Survey. He made a stirring address in which he pointed out that this country is suddenly waking up to the realization that things are bad and is demanding that something be done about it.

Every species of wildlife has suffered from the same neglect now confronting the ducks. There is no national policy for the conservation of these resources. Everything the Biological Survey has been able to get for real conservation work "has to be sucked through a straw from somebody's else barrel." He declared that it was amazing that, although duck hunting is a $500,000,000 business, it has never been placed on a factual basis.

Mr. Darling left a large and none too welcome package at the door of the sportsmen when he pointed out that it was due to their protests that the thirty-day season of 1931 had been increased to sixty days in 1932 and 1933. On the heels of that he declared that "the only controllable element is the annual kill by the guns of the sportsmen."

Following Mr. Darling, there was a talk by William C. Adams, Director of Fish and Game of New York State. The reason for his speech is not yet clear, unless it was intended to blunt the keen edge of alarm sounded by Mr. Lloyd and Mr. Darling. Mr. Adams opened with the slogan "let's raise a duck for every one we kill." He then launched into a discussion of how to do it, and admitted that, so far, little success has been attained in raising ducks in captivity. He said that they had been trying for years to find the answer and as yet did not know what it was. It might, he avowed, take another five, or even ten, years. Just what is going to happen to the remaining wild ducks in the interim Mr. Adams did not suggest, and we still didn't know just why he talked thus at this juncture.

There was an open discussion, during which John F. Baker, executive director of the National Association of Audubon Societies, pled eloquently for a closed season as the only immediate answer. Several voices were raised in support of this plea, including that of the Game Commissioner of the State of Washington, T. A. E. Lally. Also a gentleman from Illinois gave a definition of conservation which was that "the real object of conservation is to produce more game to kill and more fish to fish." This added a bit to our confusion. Then E. Lee LeCompte, Chief Game Warden of Maryland, waxed unenthusiastic about a closed season because there were still a lot of ducks in Chesapeake Bay. He didn't just see how he could convince the duck-shooters of his state that there should be a closed season. It wasn't quite clear to us why there should be a continued national depletion of ducks because Mr. LeCompte couldn't explain to Free State hunters.

Recess put a temporary end to our confusion, and in the afternoon there were interesting papers on game management, indicating that man has learned much, and still has more to learn, about managing game. Aldo Leopold delivered an outstanding paper as the Chairman of the Game Policy Committee of the American Game Association. He proved to be of the opinion that it is not necessary to proper game management to kill off all the hawks and owls and other so-called "vermin" just for the sake of shooting something. Mr. Leopold was in rather surprising contrast to the general tenor of expressed opinion in the Conference, and, therefore, one of the bright spots.

The third day of the Conference was devoted to the important but noncontroversial subject of fisheries and pollution, and to miscellaneous topics, such as G-20A and grazing, discussed elsewhere in these pages.

The meeting culminated with the adoption of resolutions. The Conference expressed its confidence in Mr. Darling and pledged support of any waterfowl regulations he might espouse; urged the unification of all conservation activities of the government under one head; defeated a resolution for a closed season on ducks, which measure was brought upon the floor as a minority report and brought to a vote.

Out of our confusion, therefore, it was evident to us that the sportsmen regard the game of the country as their property to kill or to conserve according to their lights. In fact, that view was eloquently stated by a gentleman from Illinois and enthusiastically applauded. It seemed to us that little hope could be expected from sportsmen, as represented by this Conference, until it was too late to hope for any restoration of a real quantity of game. It seemed to us that, although this was the twenty-first year in which this Conference had been held to discuss these issues, the underlying idea was to be best summarized in a policy of shooting their ducks and having them too. It was all very confusing.

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"Nantucket sees the slaughter of 100 of its 350 deer in a day, after which Governor Curley heeds many protests and ends the one-week open season. These deer, during seventeen closed years, have been like household pets. Farmers complained that they were doing damage and killing was legalized. But one shocking day is too much for the island. Sportsmen should be made of sterner stuff." *The Christian Science Monitor.*

"Sportsmen", did you say?

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Save the Bald Eagle is the title of a splendid pamphlet, the most recent one brought out by the Emergency Conservation Committee, 734 Lexington Ave., New York City. It shows the sad but true status of our National Bird, little protected, in places the subject of bounty, and threatening to follow the passenger pigeon, the Labrador duck and the heath hen into oblivion. Here is an enlightening document worthy of wide circulation and national attention.

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The January issue of the monthly bulletin of the Michigan Department of Conservation publishes a picture of an automobile draped with a dozen carcasses of does and fawns shot by three intrepid hunters in the area surrounding the Ogemaw game refuge. The caption under the picture says: "Just a sample of what occurred in many other parts of the Michigan deer country during the open season last fall." "Sportsmen", did you say?

THE RESULTS OF OVER-GRAZING OF LAND

The vegetation has been removed even to the roots and the soil is laid bare ready to be washed away with the first heavy rain. (Photograph from the U. S. Forest Service)

PUBLIC LANDS

Wasted and almost destroyed through many generations. The nation at last faces this most serious problem

WE ARE constantly told and retold how Uncle Sam, through the United States Forest Service, has prevented the destruction of our National Forests, and is endeavoring to build up a constructive plan of administration and conservation for future generations. In viewing this, which is, on the whole, a fine constructive program, the majority of the people of the United States have been blinded to another situation that represents the converse and very opposite of conservation. We know that the National Forests belong to the Federal Government, that they were set aside and kept from unregulated private exploitation, but very few people realize that there still remains as the property of the United States as a whole more than 166 million acres of unreserved and unappropriated public domain, nearly twelve percent of the total land area of the country, which has had no management at all. This is exclusive of Alaska, which has more than 300 million acres of public domain. Indeed the most abused land in the United States has been this so-called Public Domain.

Going back into history, we must realize that, as the area of the United States was progressivly increased by purchase, annexation, and simple theft from the Indians, the new land thus acquired became the property of our Federal Government. It was the policy of the Government to give away to private individuals most of this land, and Uncle Sam did thus give away through homestead laws, grants to railroads, and other schemes, by far the larger part. To be sure, a few of the forested mountain watershed areas were reserved to become National Forests, but that was all. The very poorest land—namely, that land which had no forests and did not appear susceptible of any type of farming or agriculture, even within the rather wild limits of individual speculation—alone remained, located chiefly in the dry or semi-arid regions of the West. But it was by no means a desert. On it grew dry-land grasses and forage plants, which had always nourished more or less wild animals, deer, antelope and buffalo, and this same forage was capable of feeding a presumably limitless number of domestic stock—cattle, sheep, and goats. The use of this land for ranging and grazing domestic stock was open to anyone and everyone. There was never any provision for leasing it from the Government; never any provision for buying it, except in accordance with the homestead laws, which required residence. Besides, the stockmen saw no reason to buy the land or to pay anything for its use, when they could use it for nothing.

Every once in a while there would crop up some talk of doing something with this land—of giving it to states or private owners. Therefore, the stockmen who were us-

ing it never regarded it as their own, or as something to take care of. Their motto was to get as much private profit as possible out of the forage plants that grew thereon, and each year they put on just as many domestic cattle as could subsist. Furthermore, because every individual had equal rights, each man, fearing that his neighbor would get more benefit from the free land use than he would, tried to see to it that he worked the land as hard as the next fellow.

The result was an appalling devastation, a condition in every way comparable with the worst devastation of the forests by lumbermen. And all the time Uncle Sam sat idly by and did nothing. With the over-grazing and destruction of the grass and natural vegetation, the surface soil was exposed to sun and rain. It washed away and the land reverted to almost actual desert, whence the wind collected great clouds of sand and dust and, with the rain, carved unbelievable gullies and canyons. In places fifty feet or more of soil were eaten away to choke rivers, silt up irrigation dams, and become a menace to progress. Beginning within the memory of the older generation still alive, this dreadful process continues unabated. In fact, the situation grows progressively worse.

There were a few conservation-minded people who kept struggling to have something done about this, and finally, in 1934, Congress passed the Taylor Grazing Act, which enunciated henceforth the right of the Federal Government to control grazing by domestic stock on the Public Domain. There were selfish interests, however, that feared that too effective regulation would destroy their individual interests, and these interests brought influence to bear which emasculated the bill in Congress until the Law, as finally enacted, was far from ideal.

The administration of this Act was left to the Department of the Interior, whose sole function, hitherto, had been to hold title to public lands and to give them away, but never to practise the principles of soil conservation or agriculture for an economic purpose. This Department is now gradually working out a set of regulations of such nature that it appears to many that the sum-total of real conservation likely to be obtained is to be the creation and official recognition of the vested interests of stockmen who have been using the land and will use it in the future. It is claimed that these vested interests, being assured long and indefinite tenure, will gladly assent to some sort of voluntary regulation which will result in less over-grazing in the future. Such an attitude, say the critics, gives little assurance of restoring the lands to productivity, because, based upon the existence of vested interests, it fears to do anything that the average stock raiser will not more or less readily accept. Such an attitude fails to meet the definite issue, which will undoubtedly require, in many instances, the total elimination of all grazing until Nature has had an opportunity to catch up.

Again and again we are told by economists and experts that the present depression has been the most severe of all and the most difficult to solve, because there is no more virgin territory to permit an exodus of pioneers from intensive civilization to a self-supporting life in the wild. This is true. It is the more true because the wilderness has been exploited for private and selfish ends until it can no longer come to our rescue. If land use and land development have been the basis of our national prosperity, then it would seem logical that the eventual solution of our national troubles can only be found through undoing the destruction of the past and helping Nature to restore our national heritage. There is a strange anomaly in the present situation, in that one large group of economic doctors claims an over-production of agricultural products, including livestock, and actually goes so far as to pay farmers and stockmen real money for the right to destroy crops and kill livestock, while, at the same time, the proposition to reduce the number of livestock by natural means of adequately restricting over-grazing is considered a wild dream. To be sure, there are practical difficulties to be overcome in the fulfillment of any such dream, but, if they were attacked directly, in accordance with a preconceived plan, it would seem to the logical mind that better and more permanent results could be obtained.

One fundamental obstacle that conservationists must face today, in connection with a desire to restore land usefulness as essential to restoring prosperity, is the accidental circumstance of government administration, above referred to, which treats public lands purely as a problem of engineering and administration rather than recognizing them as part of Nature quite as much as the more evident forms of agriculture. We, as the members of conservation organizations, should actively demand legislation by Congress to correct the mistakes of the past, and, more specifically, to group together all functions of public land management under principles of agricultural management, either with a Secretary of Conservation directly responsible to the President of the United States, or as part of an actively and constructively interested Department of Agriculture. There is no compromise possible, for there can never be any compromise with agents of wanton destruction. Such a new reclassification must then enter upon a program of land restoration upon a basis superior to local political influence. Our Constitution protects the rights of individuals, but such individual rights must be made to harmonize with the welfare of the people as a whole. In short, the future management of our public lands needs to go much further than the Taylor Grazing Act. It must find means to compensate individuals for individual hardships, without sacrificing the principles of strictest conservation—that is to say, much of this vast area of public land should be withdrawn from any present use by domestic stock until Nature has had time to get in her work and restore an adequate natural vegetation.

Wildlife on the Public Domain

THE TAYLOR GRAZING ACT, whatever may be its shortcomings as an ideal land conservation plan, makes specific references to wildlife, and recites under several paragraphs the necessity of protecting game and

A CONTRAST IN GRAZING LAND CONDITION

Outside the fence the forage is cropped close and if grazing continues will be down to the soil. Inside the fence a lush growth. (Photograph from the U. S. Forest Service)

he dedication of portions of the Public Domain to the ›ropagation of wild life and game as of economic value o the country. On the basis of these references an organi-ation known as the Southwestern Conservation League, ocated in that section of the country, where a large por-ion of the abused Public Domain is to be found, has en-deavored to interpret the conservation intent of the Taylor Act. Before the Taylor Act was even passed by Congress this organization held meetings of the cattlemen, sheep-men, the game interests, sportsmen, and various land management and scientific groups in New Mexico with the idea of preparing the ground for the broadest possible application of the proposed new plan. After the bill be-came law, and still before any regulations were promul-gated by the Department of the Interior, the Southwestern Conservation League held another series of meetings and drew up a concrete and practical program, recognizing a community of interest between the stockmen, the game people, and the conservationists in securing wildlife pro-tection and the highest degree of land conservation possi-ble under the broad but weak terms of the Act. It was significant that here in this huge State where Individual-ism is still spelled with a capital "I" the most advanced principles of cooperation were drawn up and agreed to. The leading cattlemen and wool-growers actually saw a value to them in terms of long-time development.

There was thus drawn up for the State a specific pro-gram which, while not altogether perfect from the ideal conservationist's standpoint, was nevertheless suited to the facts and conditions. It specifically provided that sub-marginal areas, from the stockmen's point of view, suit-able, however, for the propagation of wildlife, should be devoted to their highest economic use—that is to say, wild-life should be given a chance to develop without conflict of grazing in certain areas. The agreement further pro-vided that each of the Grazing District Governing Boards, which the Taylor Act set up, should contain a representa-tive of wildlife and general conservation interests, who, in turn, should be selected and approved by a Central State Committee which included representatives of all the organizations that had been brought together under the auspices of the Southwestern Conservation League. This Southwestern Conservation League plan still has the sup-port of the cattle and sheep interests of the State, who agree that they will stand behind it.

It seems most unfortunate that no less a person than Mr. J. N. Darling, Chief of the Bureau of Biological Survey of the Department of Agriculture, commenting at the American Game Conference in New York the last week in January upon the New Mexico plan of coopera-tion under the Taylor Act, inadvertently spoke in such a way as to seem to minimize the principle. Mr. Darling said that he was tired of getting the crumbs of conserva-tion thrown out by the business interests, and by the stock-men of the West particularly. In this he spoke the un-varnished truth, but many persons present might have inferred that it was a waste of time to try to educate the stockmen to a conservation view. He took the attitude that the position of the Biological Survey was to demand wildlife conservation by enforced federal regulation and pointed out that the Bureau of Biological Survey was drawing up a plan for wildlife refuges, the creation of which was going to secure protection of wildlife, in spite of the attitude of local business. It seemed to us that this impression given by Mr. Darling could not have conveyed his true ideas in regard to conservation.

We could not escape the feeling that, however strong may be the need for militant conservation by federal regu-lation, constructive cooperative plans remain the very foundation of progress. Local efforts toward making clear the inter-relationship between conservation and practical business are the educational bulwark of conservation law. In preparing this foundation, patience and tolerance are called for on both sides, and it becomes the duty of all sincere workers to promote mutual understanding as the most practical means of attainment of eventual per-fection. As a hitherto almost unprecedented step in this direction, it seems to us that the efforts of the Southwestern Conservation League are deserving of the highest praise and are worthy of emulation in other sections.

"They are seizing for private benefit an opportunity created for a quite different purpose by the expenditure of public money in the construction of public ways and the acquisition and improvement of public parks and reservations."

A VITAL DECISION

Massachusetts points the way to billboard control

AFFIRMING the right of the public to protection "from the intrusion of the public announcements thrust before their eyes by signs and billboards," the Supreme Court of Massachusetts has rendered a decision of incalculable importance in the battle to preserve the rural countryside of the United States from blighting commercialism and to restore it to a state of natural beauty.

This decision comes as a climax to a ten-year legal battle arising from the regulations of the Massachusetts Department of Public Works affecting billboards. Fifteen different cases, including restrictions imposed by the Town of Concord and a case involving a conspicuous electric Chevrolet roof sign overlooking and disfiguring Boston Common and the State House, were joined together for trial. Endless delay was brought about by the billboard industry, which seized upon every possible legal technicality to postpone the final decision. Finally, in November 1933, the case, and the tremendous mass of exhibits, went to the full bench of the Massachusetts Supreme Court.

Sustaining, in every particular, the State's regulations, the decision, handed down in January, was eminently satisfactory to the friend of the American landscape. Defeated in the courts, the billboard industry, unmindful of the already aroused public resentment against their appropriation of the rural landscape, has immediately started legislative action in Massachusetts to vitiate the effect of the present law. In this latest move, however, the industry will encounter a more articulate and vastly stronger public opposition than ten years ago. The offenses committed by the industry are bearing fruit in resentment, and advertisers themselves are recognizing that the rural landscape is an unpopular place for their advertising.

Undoubtedly the most significant point made by the Massachusetts decision is that it is properly within the police power to regulate offenses to the sight. It is well established that regulation of offenses to the nose and the ear is legal and proper. But now one of the outstanding courts in our country has declared that "considerations of taste and fitness may be a proper basis for action in granting and in denying permits for locations for advertising devices."

Thus the court recognizes a substantial conflict between public and private interest and a legitimate reason for restriction upon the latter. It holds that such regulation is in the public welfare even though the application and enforcement of the regulations may impose a burden upon the industry. It has been held in previous cases that outdoor advertising is a form of advertising in a class by itself.

On this point the court is specific. It declares that, in pursuing this business, "the plaintiffs are not exercising a natural right. They are seizing for private benefit an opportunity created for a quite different purpose by the expenditure of public money in the construction of public ways and the acquisition and improvement of public parks and reservations." This decision does not concede to the billboard industry the right "to use private land as a vantage ground from which to obtrude upon all the public traveling upon highways, whether indifferent, reluctant, hostile or interested, an unescapable propaganda concerning private business with the ultimate design of promoting patronage of those advertising."

This has been the argument of the friends of the rural landscape for many years. Another point that has been stressed by those seeking a curb upon the increasing in-

The Massachusetts Court recognizes, in its decision, the right of the state, "even to the extent of prohibition," to control billboards in the interest of safe travel on the highways. It holds that they are a menace to safety not only when they obscure vision but also when they distract the attention at curves or elsewhere on the highway.

vasion of billboards has been the danger they cause by distraction of the attention of the motorist. Here, also, the court is found in accord. It affirms the right to exercise the police power in this regard "even to the extent of prohibition." It regards billboards as a peril, not only in cases of obstruction of view, but because they cause distraction and inattention, the reasons of many accidents.

In the words of the decision, the traveler on the highway has a right to "a peaceful and unannoyed journey." The court also emphatically affirms the right to restrict or forbid the billboards when they "deface natural scenery and places of historic interest." The billboard industry has always claimed that it chooses billboard sites with due regard to these considerations, but such claims are not borne out by the facts, as any motorist can testify.

In upholding the Town of Concord in its drastic restrictions, the Court points out that this community is one of outstanding historic interest. It is, in effect, a national shrine. It is visited by many people every year, which is the reason the billboard industry sought to plaster it with signs. To protect itself, Concord adopted severely restrictive ordinances, and the Court sustains it in its right to do so.

The brilliant Chevrolet sign, competing for attention with the famous State House, the Court regards as definitely offending against taste and fitness and therefore subject to removal under the police power.

None more than the billboard industry itself recognizes the great importance of this decision. It is a confirmation by high legal authority of all of the contentions of those seeking the removal of unsafe and offensive billboards from the rural landscape. This decision shows the way to other states. It remains to be seen whether the billboard industry will recognize the inevitable.

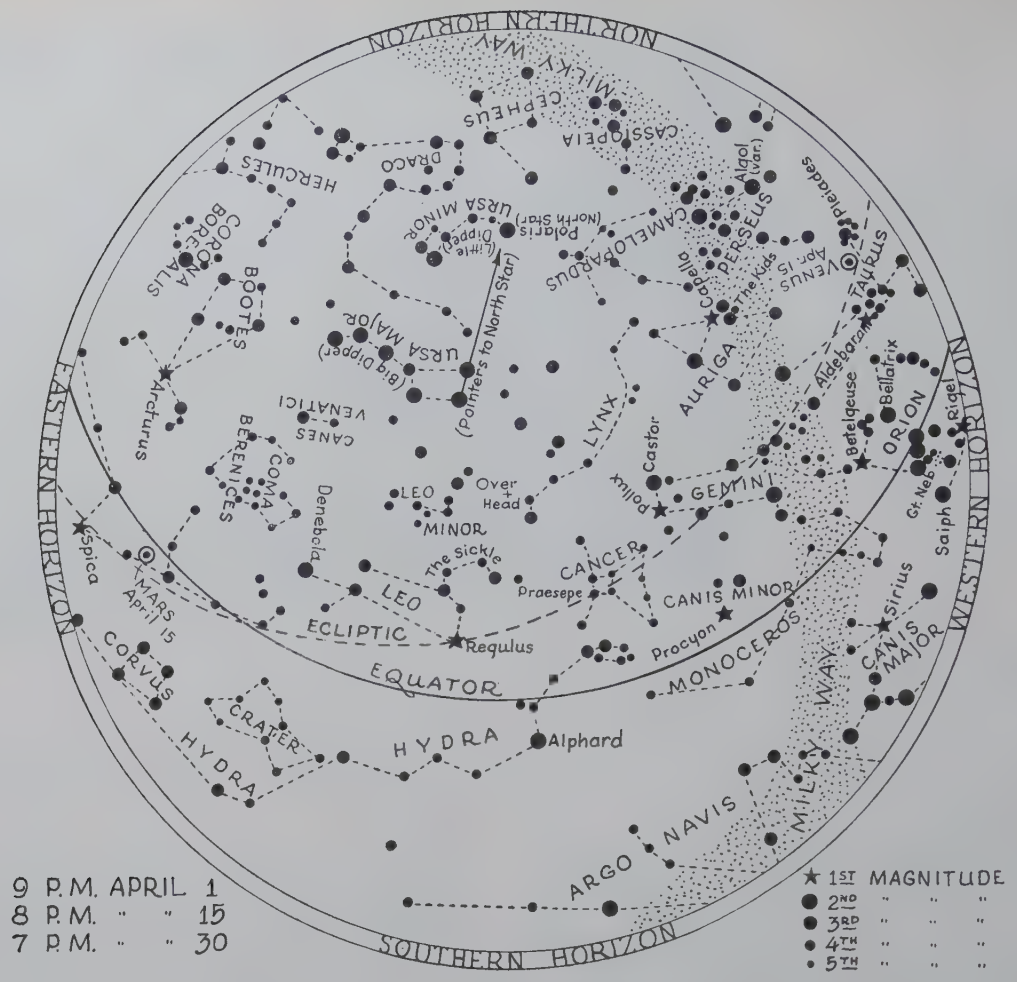
PACK FOREST EDUCATION BOARD MAKES AWARDS

EARLY in 1930, the Charles Lathrop Pack Forestry Trust set aside a fund devoted to fellowships with the primary purpose of training leaders in forestry. The fund was to be administered by a Board of Directors consisting of a number of prominent foresters, and the fellowships were to be directed with the least possible restriction, and at the full discretion of the Board, which was to be entirely free to work out its own procedure and principles. These fellowships, it was thought, would stimulate effort on the part of ambitious forest students or professional workers of outstanding qualifications and encourage men of marked ability and aptitude for leadership to enter the profession of forestry. The fellowships were ordinarily restricted to men of American or Canadian citizenship, and no restrictions made with respect to age, education or practical experience. The Board was free to select men already engaged in professional work who would be benefited by a year or more of study at a school of forestry or at an institute of research, or in travel. In all cases the award was to be made to the gifted man who demonstrated natural powers of intellectual and personal leadership, and who intended to make forestry his life work.

Since that time the Board has met annually and selected successful candidates, men of promise in the field of forestry. It has served an important purpose, not merely in training leaders for forestry, but indirectly in encouraging men of unusual qualifications to enter the profession.

Thirty men have been awarded fellowships, among whom are several Canadians.

The latest meeting of the Board was held in Washington, D. C., January 27th, and eight fellowships were awarded for studies in various branches of forestry.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

MARS NEARS THE EARTH

By ISABEL M. LEWIS

THE RUDDY little planet Mars is now at its best as seen from the earth. Not until the latter part of May, 1937, will it again be in such a favorable position for observation. On April 6 it will be in opposition to the sun and will then rise at sunset and be visible all night. It will be seen only about five degrees north of Spica, in Virgo, at that time and will be nearly as bright as Sirius, but decidedly reddish in color.

Every two years and two months, approximately, the planet returns to opposition, at which time the earth, sun and Mars are in line, with the earth between the sun and Mars. The time of nearest approach is not exactly at the time of opposition but a few days later. At this return of the planet to opposition it will be nearest to the earth on April 11, when its distance from us will be about 57,700,000 miles. All oppositions of Mars are not equally favorable because the orbit of the planet is an ellipse, not a circle, and its distance from the sun varies more than 26,000,000 miles. When the planet is in opposition at the time when it is nearest to the sun it may come as close to the earth as 34,600,000 miles. When its opposition occurs at the time when the planet is farthest from the sun its distance from the earth may be as great as 62,900,000 miles. There are, then, favorable and unfavorable oppositions and the most favorable oppositions occur at intervals of fifteen or seventeen years.

The most favorable opposition of Mars in many years occurred in August, 1924. At closest approach, that year, Mars was distant 34,640,000 miles from the earth and the brilliancy of the planet surpassed that of Jupiter. The opposition of this year is a little less favorable than the average; that of 1937, which will occur on May 28 of that year, will be about average, with the planet distant 47,240,000 miles at nearest approach to the earth. There will be, in 1939, another one of the most favorable oppositions of the planet, when, on July 27, the planet's distance from the earth will be only 36,035,000 miles.

The visibility of the surface features of the planet as well as that of the two tiny satellites, Deimos and Phobos, respectively about five miles and ten miles in diameter, depends greatly upon the distance of the planet from the earth at time of opposition. It is then that the day side of the planet is turned toward the earth and the closer the planet is to us the more detail can be observed. There is plenty to be seen on the surface of Mars at a favorable opposition with good seeing and good telescopes. Some believe that the best results can be obtained with not too powerful a telescope and not too great a magnifying power, because, under such conditions, the "boiling" of our own atmosphere is so magnified that it prevents the steadiness and clearness of vision so greatly to be desired. The satellites can be seen only under favorable conditions with powerful telescopes. The writer saw them in 1924 through the 26-inch equatorial of the Naval Observatory, at a time of exceptionally fine seeing, as brilliant little points of light. Two years later, on a night of ordinary seeing, they were hopelessly invisible.

At a close opposition, under fine observing conditions, Mars is a fascinating object to observe, even in a telescope of moderate size. The markings on the surface are diversified in outline and color and give one the impression that there is a great complexity of detail just beyond the reach of the eye. Were the planet only as near to us as the moon what wonders might be revealed to us! The question of the habitability of the planet might then be much nearer a solution than it is now.

Mars has a day only a little longer than that of our own planet. The inclination of its axis of rotation to its orbit is about the same as that of the earth to its orbit. The Martian year is one year, ten and a half months. So the Martian seasons are similar to ours but nearly twice as long. There is a summer, winter, spring and fall on Mars as there is on the earth. There is also an atmosphere on Mars although it is much less dense than our own, and there are clouds although they are comparatively rare phenomena. Water on Mars is undoubtedly scarce. There are white polar caps, presumably of snow, and they show marked seasonal changes. In the Martian midwinter the cap in the winter hemisphere is large, often reaching midway to the Martian equator, but shortly before the spring equinox of that hemisphere it begins to shrink continuously until, by midsummer, if it is in the southern hemisphere of the planet, it may completely disappear. The northern polar cap never entirely vanishes but shrinks to about 200 miles in diameter. In midwinter the south polar cap attains a much greater size than the north polar cap does in its winter season, which indicates that the summers are hotter and the winters colder in the southern Martian hemisphere than they are in the northern. It has been estimated that, with the exception of the permanent portion at the north pole of the planet, the polar caps of Mars, if composed of ice, cannot be more than a few inches thick on the average. So the supply of water furnished by their seasonal melting is meagre.

Other conspicuous features of the planet are the dark areas, presumably due to vegetation, since they darken in the spring with the melting of the polar cap and decrease in size and fade out in the autumn. They lie mostly in the south tropical region, forming a sort of dark belt around the planet. The chief surface markings are quite permanent in form and position but vary in tone and intensity. There are also extensive reddish regions believed to be desert-like tracts. They show little seasonal change. They cover a great part of the surface and give the planet its ruddy appearance. Finer details of the planet's surface include the much discussed "canals" which consist of more or less distinct lines, sometimes of great length and often connecting small dark spots which are referred to as "lakes" or "oases." The nature of these markings are still much in dispute but the most reasonable explanation is that they are strips of vegetation bordering on water-ways, which are not necessarily artificial in origin.

The temperature of Mars must be one of great extremes due to the rareness of the atmosphere. Frosts at the equator probably occur nightly. The surface temperature of Mars, at mid-day at the equator, has been estimated to be about the same as it is on earth on a clear, cool day in spring, or about 60 degrees Fahrenheit.

Surface gravity on the planet is only a little more than a third of what it is on earth and a man weighing 150 pounds here would find his weight reduced to 57 pounds on Mars. The diameter of the planet is 4215 miles, not much more than half that of the earth, and its surface area is not much more than a quarter that of the earth. A most striking difference lies in the great abundance of water on the earth—three-fourths of the earth's surface is water—and the great scarcity of water on Mars, presenting a most serious problem in conservation to its inhabitants, if such there are.

Jupiter, the giant planet of the solar system, in comparison to which Mars is but a pygmy, is also visible in the evening sky this month, in the constellation of Libra. Next to Venus it is the most brilliant stellar object in the heavens. It is one of the most interesting planets to observe telescopically. Its four historic satellites, discovered by Galileo, and its belts are easily visible in the smallest telescopes. Venus may now be seen in the evening sky, about 30 degrees above the western horizon at sunset on April 15 and setting about three hours after the sun. Mercury will not be visible this month because of its nearness to the sun. Saturn is now a morning star rising a little more than an hour before the sun, but is too far south to be seen to advantage.

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Plans are under way to renew the western trail trip activity of the American Nature Association this year by taking a party into the high country of Grand Teton National Park. See the announcement on Page 165 and write to the Washington office for further information.

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Ben's Queer Gift

Another Trailside Treasure Story

By JANE ADAMS PARKER

"MOTHER said my cold was too bad to go treasure hunting, today," said Jerry, a little sadly, as he opened the door for his aunt Dot.

"Oh, well," Aunt Dot flashed him a smile. "The trail is really too wet and soggy for any of us to go. I took a 'hike' out to the old bridge this morning, and saw some lively little snow fleas hopping on the snow along willow stream. But it was hard walking. I saw a saucy bluejay, and a cardinal, way, way up in the top of an oak. He whistled and whistled just as if he were trying to wake up the whole woods. But, what do you suppose? Ben has another SOMETHING for our Treasure House, waiting for you down at the garage. I know Mother will let you go that far."

When Aunt Dot said things that way, the twins knew it had already been settled with Mother. So they hurried into their wraps, and skipped along down to Grandpa Arnold's garage. As they went up the side stairs Aunt Dot turned to the children.

"I put Fuzzy Wuzzy out in the store room," she said. "Bats sleep much better where it is quite cold."

She went before the children across the hall, and had just put her hand on the door knob, when the door of the little room Grandpa had given them for their museum flew open as if by magic, and Grandpa's booming voice sang out, "Welcome to Trailside Treasure House. How do you like it?"

Jo and Jerry stepped inside and looked about. Years ago Grandpa had fixed the place up for a work shop, with a fireplace and benches. Now a roaring fire greeted them, sending a rosy light through the room. An old buffalo robe, Grandma Arnold had kept for ever so long, lay before the fire.

Ben had just finished putting up some shelves between the two dormer windows. He tried to make his lips grin at them around a mouthful of nails.

Along the other side of the room were some more shelves with large mouthed jars, boxes for mounting flowers and insects, labels, glue, pins and three magnifying glasses. On a hook hung three nets that had belonged to their mother, Aunt Dot and Uncle Jack.

"What are these?" Jo held up a small green suit with a pointed, elfin cap to match.

"Oh, those are the suits we used to wear," answered Aunt Dot. "I think they'll about fit you now."

"But we need another Treasure Hunter, for the other girl's suit," said Jo.

"Maybe," said Grandpa Arnold, looking wise, "we could get Rosy Posy to join our hunters."

The children called her Rosy Posy because she looked so like a flower with her crown of golden hair and big blue eyes. But her real name was Rosalind Prosey. As Grandpa spoke, out popped Rosy Posy from the small closet just behind him. How they all laughed at the surprise.

Ben had gone out into the store room, and came back in the midst of the excitement holding a pan with the queer SOMETHING in it.

"I managed to scoop up some sleepy frogs for you, from the mud at the creek," he said, holding the pan for the children to see. "They'll sleep this way until it's warm enough to come to life again, if they're kept where it's almost freezing. When a frog decides it's time to go down into the mud at the bottom of the water—that's their winter quarters, you know—he just lets the air all out of his lungs so he won't float. And down he goes. Some frogs and toads burrow away on land."

"Oh, Ben, those are jolly specimens for our Trail-

ide Treasure House. . . ." Jerry began. But Jo interrupted him.

"Shh—" she exclaimed, "what's that funny noise outside?"

They all stood still a moment listening. Then Aunt started for the door. "Maybe it's another little friend come to join our museum," she said. "Let's hurry out and see."

So with Aunt Dot in the lead they all scurried out into the hall, and down to the yard.

To be continued.

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Taddy's First Party

By FLORENCE H. MOORE

Tad-pole didn't like his looks;
You see, he hadn't a leg;
But he had a funny tail,
When he hatched out from an
egg.

He looked not like his mother,
Nor yet just like his dad;
He wondered how they got that way,
When he was just a tad.

But Taddy grew two legs,
Then another and another;
Still he didn't seem just like
His father or his mother.

But one spring day he noticed,
As he sat upon a log;
That all his funny tail was gone—
He had become a frog.

And the little forest folk
Are gathering, you see,
To welcome grown up Taddy,
In a friendly jubilee.

PUZZLE: Find the Fox and baby Deer

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How the Rabbit Stole the Otter's Coat

A Cherokee Indian Myth

Retold by DOROTHY E. PLETCHER

THE animals were always arguing about their good looks. Some made a fine appearance indeed in their brown coats. Others looked well in their black or gray outfits. Those who had rings on their tails thought themselves, oh, so very much better looking than the ones who had no tails at all. So finally they held a meeting to decide who had the most beautiful coat.

The animals had heard that the Otter had the prettiest coat of all. But he lived away up the creek and hardly ever visited the other animals. However, they were sure that he would appear if he heard about the contest for animal beauty laurels.

Now the selfish Rabbit decided to keep the Otter from getting the prize, because he wanted to win

first place himself. And, without telling a soul, he went to the Otter's home.

"I've been sent to bring you to the council," he told the Otter. "The animals thought you might not know the road." The Otter thanked him for his kindness and the two of them set out together for the council ground.

One day on the trip the Rabbit made a paddle. "What is that for?" inquired the Otter.

"Oh," said the Rabbit, "when I sleep with a paddle under my head I have good dreams." By and by the Rabbit cleared a path down to the river.

"Why do you do this?" asked the Otter.

"This is called 'The Place Where It Rains Fire'," replied the Rabbit. "Often it rains fire here. Suppose you sleep and I'll watch. If the fire comes I'll call you so that you can jump into the river. Be sure to hang your coat on a tree so it won't be burned."

So the Otter hung up his pretty coat of soft dark-brown fur and went to sleep. This was the Rabbit's chance to trick Otter. He put hot coals on the paddle and tossed them up in the air. "Oh! oh! it's raining fire!" he cried. The poor, frightened Otter then ran and jumped into the river. And he has lived in the water ever since.

Then the tricky Rabbit put on Otter's coat and sallied forth to the council. When the animals saw him coming they shouted: "Here comes Otter!" They wondered why the Otter kept his head down, with one paw over his face. But suddenly the Bear jerked the paw away. And there sat Rabbit. Up he hopped and was scampering away when the Bear struck at him. Although Rabbit got away, the Bear had pulled his tail off. So the Rabbit has no tail.

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PHOTOGRAPH BY SPENCER R. ATKINSON

Strange Dinner Guests

By AGNES AKIN ATKINSON

MR. SKUNK poked his short nose out of a hole in a low rock wall and sniffed the air. Satisfied that no danger was near, he ambled right on out into the halo of an electric flood light. He acted as though he owned the whole place.

Proudly he climbed on top of the wall and stood beside a small animal feeding-table. Two low chairs waited, silent and still. Without a moment's hesitation, Mr. Skunk climbed into a low chair and placed both front paws on the table-top. There before his nose was a plate of the best breads, meats and table tid-bits he had ever tasted. He ate and ate until his sides stuck out.

A young Gray Fox leaped upon the wall. Cautiously he walked over and sat in the chair at the other end of the table and ate food from the tin plate that he found right under his nose. Mr. Skunk gave the newcomer a sideways glance which seemed to say, "You're welcome to stay there, but don't come any nearer."

Yosemite School

ouncement is made of the session of osemite School of Field Natural His- r 1935, which will start the last full n June and continue for seven weeks. umber of students is limited to twenty ere is a prerequisite of sufficient edu- l background for admission. No tui- charged and expenses are extremely able. The staff which shares in the in- on is a distinguished one, and the comes to a climax with a high coun- ck trip of two weeks during which the fauna and geology of the High Sierra udied. Full details about the course and ualifications for it may be obtained from Harwell, Park Naturalist, Yosemite nal Park, California.

International Show

ith sixteen thousand acres devoted to the ing of bulbs alone, Holland is an annual r show itself, and a Mecca for flower s. Once every ten years, however, it out- itself and provides the site for the In- tional Flower Show at Heemstede. The tiful old park of Groenendaal, an old e in Heemstede, will serve as a flower covering fifty-five acres. There every t will be exerted to demonstrate the effective arrangement of spring flowers shrubbery. Mass plantings of spectacular ty have been made for the main section. e will be indoor displays and other great oor exhibits. For example, half a mil- tulips have been planted in front of the hall—the Court of Tulips.

dvance description, or a secondhand re- on this show, however, is unsatisfactory any flower lovers. Therefore, the Horti- ural Society of New York is organizing ecial pilgrimage of Americans, in co- ation with other horticultural groups. American contingent will sail from New k on April 30 on the *S. S. Statendam,* ship of the Holland America Line. Two xpense tours have been planned, one of e providing for attendance at the great lsea Show of the Royal Horticultural So- y of England. Full details relative to the can be obtained from John T. Scheepers, Fifth Avenue, New York City.

A Book of Poems

Amateur is a word that is variously de- d. Often it is used to indicate a person ose abilities are conspicuously elementary. perly the word should only indicate those o do something well but only for the love doing it. This definition prevails in the rld of sport, but less so in the world of arts. In *Spin Dance* Paul Southworth ss, poet, and Harold J. Matthews, artist, n their considerable talents as amateurs in ook of poetry, illuminated with delightful oleum block decorations, because they de- ht in so doing. They have written and cut, pectively, because they want to and be- se it widens their circle of friends and ir field of experience. This is their sixth lume, all published by themselves, and is delightful volume. Copies are available m Miss Laura Sturlaugson, Editor of *rse and Art,* 13 West 2nd Street, Willis- n, North Dakota.

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Photographic Notes

BY SAMUEL BROWN

The photographic section of NATURE MAGAZINE is designed to be of service to its readers interested in photography, in particular Nature photography. All are invited to submit any problems or questions, which will be handled with dispatch. Any suggestions with respect to the conduct of this department will be welcomed by the editor.

With the arrival of spring, those of us who have put our cameras up for the winter are now ready to retrieve them from the closet shelf. Let us go over them carefully, in order to guard against any failures which might result from their idleness. Above all, is the lens clean? If it is not, all you need is a soft, *unstarched*, linen handkerchief. Open the shutter, place the handkerchief over the end of a match and polish the lens. In the case of double-lens cameras remove the front element. This will allow you to work through the shutter opening. The rear surface can easily be reached by removing the back of the camera. If the lens is dirty breathe on it and then rub quickly with the handkerchief.

Dust the camera inside and out. Be sure to wipe carefully any part of the inside that comes in contact with the film. The small, thin rollers along which the film rolls usually gather dust. If this is allowed to remain, the films will have fine lines running the full length of the pictures.

Before making an exposure, be sure that the camera is focused for the correct distance; that your shutter is set for the right exposure; that your composition is pleasing and that you are holding the camera straight. Keep the camera close to your body and before releasing the shutter, hold your breath. This will assure sharp results.

Wildlife Pictures

Wild life offers, at this time, tempting game for the camera hunter. No special equipment is necessary. That which you now have is quite adequate. Pictures of animals and birds find the most appeal when they are shown in their own natural setting. One of the biggest thrills coincident with animal picture hunting is the stalking of your "prey," finding their holes and natural gathering-places and hiding with the camera ready to "shoot" the minute your subject is seen.

If it is a small mammal or bird, the camera (equipped with a portrait attachment if it has only one lens) is set for the largest diaphragm opening and a medium-fast shutter speed. It is placed on a firm, level support and focused on the subject's nest or food, or the place where it is expected to alight. Incidentally, beef suet is a delicacy which birds rarely resist.

A stake with a screw eye is driven into the ground close to the camera and an inconspicuous cord or heavy string is attached to the shutter release; run through the screw eye and back about one hundred feet, where the photographer waits for the opportune moment and then snaps.

THIS PICTURE WAS TAKEN ON FAST ORTHOCHROMATIC FILM AT F. 8 AND WI[TH] ONE-TWENTY-FIFTH OF A SECOND EXPOSURE

For those who haven't the patience to wait, or who prefer to have the subject take its own picture, they may do so in the following manner. A mouse trap is made secure below the camera and a string made fast so that the trap will operate the shutter. A second string leads from the spring to some location where the bird will unconsciously hit it. A very slight pressure thus exerted will spring the trap and work the shutter.

A favorite method of mine for photographing chipmunks, squirrels and such small folk is to fasten food on the end of the cord attached to the shutter release. The squirrels and their friends can rarely control their curiosity, and in going after a tempting meal they snap their own pictures.

I have found that it is wise to camouflage the camera in resemblance to the surroundings. Mammals and birds are easily frightened by something so foreign to them as a camera. Then, also, the subject appears less cautious than if the camera were left entirely unconcealed.

Apart from the suggestions made above, little can be said as each occasion requires careful judgment of stops and shutter speeds. Generally it is desirable to try to have enough light to permit an exposure no longer than $\frac{1}{25}$ of a second and if possible as fast as $\frac{1}{100}$ of a second. Since the photographer is dealing with subjects which move with great rapidity, speed is the greatest factor.

At the Zoo

Pictures of large mammals, such as tigers, bears, lions and elephants, can be photographed in what appears their natural haunts by visiting the local zoo.

In many cases it will be possible to shoot through or over the tops of the cages, thus getting clear unobstructed views. Try to photograph towards the den or cave which houses the animal. This will result in a more natural picture. Taking the shot directly across the cage brings into sight the other side with the bars and people watching, making it obviously a "zoo" picture. Of course, at times this cannot be helped because of the position of the animal or the unavailability of a good point of view.

When it is impractical to get the camera through the bars or over the cage, holding it as close as possible to the bars will get the same result. This is because the bars are so far out of focus that they appear to be entirely absent. The same holds true whe[n] the inclosure is made of chicken wire.

"Trade Hints"

Varitone developer, as sold in co[n]pounded form, produces beautiful ton[es] ranging from brown-black to orange on co[n]tact and bromide papers, by direct develo[p]ment.

Vacation Photography and *Outdoor E[x]posure Guide*, two very interesting and i[n]structive pamphlets, are available witho[ut] charge.

For the miniature camera worker the ne[w] "Panatomic" film is a blessing. Its spee[d] is about the same as the regular film. It has [a] panchromatic emulsion and is capable of e[n]largements many times its original size.

Guide To Photography

The *Wellcome Photographic Exposur[e] Calculator, Handbook and Diary* is a boo[k] containing a wealth of photographic in[-] formation. Primarily this book is a calcula[-] tor which assures correct exposure unde[r] every condition encountered in photography. Of special interest to the naturalist-pho[-] tographer is the information on filters [-] when to use them; how to use them an[d] the increase in exposure necessary. Ligh[t] tables for each month, and plate and film speed factors for practically every emulsion on the market form an essential part.

Information on development, toning[,] staining, printing, lantern-slide making[,] focusing, lens speeds, color photography and the latest development in fine grain work is incorporated in its pages. Space in which to keep a record of exposures and a brief diary is conveniently located in the center.

The size of the book, $5\frac{3}{8}$ x $3\frac{1}{4}$ inches, makes it handy to carry in the pocket, handbag or camera case, and the price, 75c, complete with wallet and pencil, makes it an indispensable asset to every photographer. Published by Burroughs Wellcome Co., 9-11 East 41 Street, New York City.

All who have any photographic problems or difficulties are invited to correspond with the writer, who will give each inquiry his personal and prompt attention. Address the department editor and enclose a stamped, self-addressed envelope for reply. We wish all of our readers to use this service.

MARVEL OF PHOTOGRAPHY

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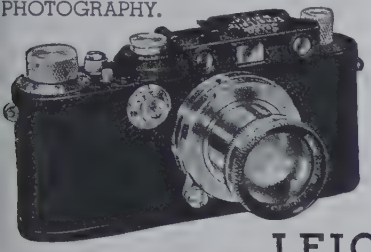

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Appalachian Trail "Post Office"

The Appalachian Trail's solitary mail box is located over 1200 feet up on Bearfort Mountain, Greenwood Lake, N. Y. "Postmaster" is George W. Hanson of the Warwick A-T Group.

An oblong metal box is affixed to a tree, and a sign inside the box lid notifies one that George likes plenty of mail from hikers. He also welcomes comments on the trail's condition. The box holds a small log book, pencil and a batch of government postal cards, with George's name and address rubber stamped on the address side.

The most critical observations are made by the lake summer visitors, unaccustomed to skyline walking. Listen to these: "Was the trail laid out by a human being or a Rocky Mountain goat?" "We are poor crippled men and suggest you take a couple of sticks of dynamite and blast the whole trail up and down!" "You have no judgment of miles. Take my advice and measure them again." "Listen, George, couldn't you put a box with some water here so I could get a drink next time?"

Here's one from a hiker-camper: "I'm doing the lone act, with house, kitchen, bed and grocery store on my back. Fourth day out. Water is scarce."

When George's mail decreases, he knows why, so loses no time in replenishing the postal supply. The other Sunday the Forum editor was with George on a club trip—cross-country, with no guarantee of contacting the precious P. O. The unfeeling leader guided us everywhere but to *the* place, but George accepted the disappointment with his customary good nature.

Mrs. Jaques' Whims

Bertha E. Jaques is best known to the world of art for her etchings, and to the world of Nature lovers for her flower etchings. Her activities are not, however, confined to the field of etching and her interest in Nature is many-sided, finding attractive form in a little book of Nature poems entitled *Whims*. This was brought out merely to give to friends, but a copy has come to us and we cannot refrain from expressing our delight in the simple and sincere charm of these verses. So we wrote Mrs. Jaques to ask her what a copy cost so that we might review it, all too briefly, here. Her reply was fifty cents, "which will never cover my printing bill." Her address is 4316 Greenwood Avenue, Chicago, Illinois.

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Hiking and Camping Forum

Conducted by
Ernest A. Dench

Inquiries concerning the fields embraced by this department will be answered by mail if a stamped addressed envelope is enclosed. Address the department editor.

Brevities

Hike, hiker or hiking are unpopular words in the British Isles. Youth Hostel Association of Northern Ireland recently had a contest to secure an alternative description. "Shuler" was chosen from the 1100 entries. It is an Irish adaptation of "suibhal," the act of walking. Ruckster, wendler and yonderer were among the rejected suggestions. Now we'll a "shuling" go! . . . Forum Editor's trail pal—a gadget hound—nonchalantly tears out a leaf from a 2" x 3" book when he washes at the brook. The leaf dissolves into a good lather as water is cupped in the hands. Each book is good for 25 ablutions. When weight is a consideration it might be taken instead of bar soap. . . . *Minnehiker Trails of 1934* is a handsome brochure which reviews, in text and picture, past year's accomplishments of this lively Minneapolis club. Congratulations, Editor Louis Heltzer. . . . May 13-15 are dates which Atlantic coast clubs should keep open. Seventh Appalachian Trail Conference slated for D. C. and Virginia. Potomac A-T Club are the hosts. . . . If your tent is affected with mildew, thoroughly wet such places and rub in an equal mixture of chalk and soap. Expose tent fabric on the ground during sunny days until mildew disappears. Finish with a plain water rinse and another sun bath. . . . Hastings (Neb.) Outdoor Club seems to have an unlimited supply of cabins and farms at which to conclude their half-day Sunday hikes. After supper it is the leader's responsibility to provide entertainment. Any aspirants for this "Master of Ceremonies" rôle?

Current *High Spots* (Adirondack Mt. Club) contains, by Harry W. Hicks, a comprehensive article on New York State's skiing facilities. Which reminds us that the Field and Forest Club (Boston) had a private car on all trips of the B. and M.'s *Snow Train* this past winter. . . . A Middle-West auto firm specializes in new parts and accessories for home-made camping trailers. . . . Writing to the *New York Times*, J. Rowe Webster suggests a safety device for night walking on country roads. Dangle a knotted white handkerchief from the hand facing traffic. . . . A *Trail Guide* to the mountains surrounding Williamstown, Mass., is obtainable for a quarter from Williams Outing Club. The double-page map is printed in too dense a black, blurring contours and concealing names. Still the book contains much useful, up to date information —and some scenic photographs. . . . We hazard a guess that Philadelphia Trail Club members read their schedule more carefully than some do in other clubs. Trips mention either "cooking possible," or "cooking not certain." A hungry hiker is in the same class with a starved husband! . . . Mount Baker Club, Bellingham, Wash., recently acquired a clubhouse in a unique way. Owner of a fine old house offered to deed her property to any worthy organization willing to care for a small mortgage and yearly taxes. Only stipulation that the feminine owner be allowed to become the permanent caretaker. . . . A body-breathing raincoat is announced by a leading British rubber manufacturer. Shoulder has an air-layer lining, made of a new patented synthetic fabric. Lining absorbs moisture instead of condensing on the inside. . . . Believed to be the first club of its kind, the Ski Mountaineers of California will specialize on ski trips to peaks more than 10,000 feet high. President is Dr. Walter Mosauer, foremost Western authority on skiing technique. . . . Formerly the Appalachian Trail in Maine meant Katahdin—and nothing else. Yet Western Maine has other lofty points—twelve more than 3800 feet, led by Sugarloaf, 4237 feet, state's second highest. Recent extension of A-T from Mt. Bigelow to Saddleback, in conjunction with side trails, will open a new, fascinating primeval area to hikers as soon as the snows are out. Several clubs announce trips here this summer.

Mimeographed bulletin, "Let It Rain," just compiled by this Forum, gives waterproof clothing and equipment suggestions and sources of supply. Price—a 3-cent stamp to American Nature Association members; 10 cents to non-members.

Trailer on Camping Trips

The trailer used on camping trips of the Wisconsin Go-Hiking Club is one of the club's best investments. It is a hybrid two-wheeled vehicle, made of materials salvaged from used autos, and has a rectangular body with an open top. Initial cost to club, $30. Operation and depreciation are covered by a charge averaging ten cents per person for each day's use of the equipment.

The trailer carries all the freight any week-end camping trip may require. It is surprising the bulk which can be stowed away under the tarpaulin cover. When in camp the trailer is handy as a storage space for food and culinary articles. On occasions its adaptability has been equal to such uses as a wardrobe, work table, kitchen sink, buffet, fuel wagon and a vaudeville stage. On rainy nights it becomes an auxiliary shelter, if a canvas is stretched from a car to the trailer. President F. M. Blackburn furnishes us with the above reliable information.

Meet the Cascadians

The membership information bulletin issued by the Cascadians (Yakima, Wash.) discloses an organization actuated by high ideals. The guest, as a prospective member, is diplomatically counseled to emulate a good Cascadian on the trail. He learns, for instance, that a good Cascadian will have his own footwear in order, will respect the leader's orders, and so on. Rarely have we come across a booklet of this type devoid of legal phraseology. We consider it a model for any club conducting a conservative membership campaign. William Hassell and E. R. Thoma are president and secretary, respectively, of the Cascadians, established in 1921, and still going strong.

Great Smokies Handbook

The Forum Editor's ideal of a club schedule is the annual handbook of the Smoky Mountains Hiking Club. While it serves its main purpose as a recorder of forthcoming club activities, it is also of intense interest and value to Southern mountaineering enthusiasts everywhere.

The club trips are breezily written, while the poetry extracts are chosen with discrimination. Nine of the best entries in the club's scenic photographic contest are reproduced. Hikes that can be taken independently are indexed. There is a Smokies bibliography. A preliminary base map of the Great Smoky Mountains National Park is bound to the inside back cover. It gives the principal contours, despite being printed in only one color. Editor Dorothy W. Haasis deserves praise for her work on this 1935 edition, fifty cents from the Smoky Mountains Hiking Club, P. O. Box 1454, Knoxville, Tenn.

Wilderness Food Supplies

Now and then we are asked what is the most practical duration of a wilderness camping trip—one where all supplies have to be hauled in on one's back, and no chance of replenishment except by the same toilful means.

Arthur C. Comey, New England exponent of the ten-pound pack, points out that the camper who stays out more than five days will be carrying as much food as the other contents of his pack—or twenty pounds in all. Comey estimates that when one is roughing it the usual daily per person dry food consumption is almost two pounds. By dry we assume he discounts the water content of vegetables, fruits, etc.

It narrows down, in our estimation, to how strong you are, and whether you don't mind an uncomfortable day or two in reaching your base. A party of four is ideal, as the cooking utensils and some other items need not be duplicated. More food can be carried instead to prolong the sojourn.

Expanding Eastern Park

Metropolitan New York hiking clubs—a score of them—are divided on the issue of acquiring adjacent wild lands, now privately owned, to expand materially the Palisades Interstate Park. This N. Y.-N. J. reservation, at present 47,000 acres, is extensively used by hikers. A make-work undertaking for the CCC and other relief agencies is involved.

Favoring clubs contend park annex will afford greatly increased hiking and camping facilities, now somewhat restricted under private ownership. Opposing clubs claim that the park authorities will radically change the wilderness environment of these private tracts, in view of the way the present park area has been handled. To say the least, the Forum Editor can feel a fierce storm brewing over his home terrain.

The Outdoor Book

This Camp Fire Girls' publication lives up to its advertised claim of being "a practical handbook for those who lead hikes and short camping trips." The club schedule chairman, at a loss to devise new types of hikes over old ground, will find suggestions aplenty.

The co-authors, Gladys Snyder and C. Francis Loomis, err in encouraging indiscriminate trail blazing. They advocate nailing painted shingles on trees. Private property rights should be respected. On the other hand, the co-authors are to be highly commended for substituting leaves for paper (it disfigures the landscape) in a paper chase game.

The popular leather top rubber boot is omitted from the clothing and equipment advice. The camp cookery recipes are admirably grouped, and include the principal outdoor culinary triumphs of C. F. G. camps. A hearty supper, followed by entertainment, novel ideas for which are given. This well-written book is 50 cents, from the Camp Fire Outfitting Co., New York City.

Back Country Motor Camping

One motorist partial to week-end camping trips uses the trunk at the back of his car as a refrigerator. He packs it with crushed ice, and stows away bottles of favored beverages, fresh meats, provisions, vegetables and fruits.

There is desirable semi-wilderness country within a drive of 40 to 60 miles. He uses main highways as a means to getting there, but does not stay on them. His favored haunts are the back roads, more or less abandoned, but still passable. As his car is several years old, he does not mind the wear and tear on it.

He likes to camp on the site of a hillside farm, now growing up in scraggly timber and brush. The tents are erected, the fire lighted, and the evening meal prepared. Most of the perishable foods go the way of all good things, but the semi-perishables—butter, bacon, mayonnaise, etc.—are packed in crocks in the brook bed for cool overnight keeping. Canned goods fill out the Sunday menus.

The ice in the auto chest lasts several hours, depending on the weather. During an excessively hot Saturday he defers the purchase of ice and perishable foods until he arrives at the nearest large town to his camping base. This means one and a half to two hours increased refrigeration at no added expense.

This motor camper has become quite an authority on back country roads in his part of the state. In the beautiful surroundings, rarely visited by others, his party enjoys a tranquil week-end. Our friend is careful to confine his invitations to those of his friends and relatives who relish a mild dose of roughing-it away from crowds and civilized conveniences.

Outdoor Poems

Under the title *Days Out of Doors* Ralph Atherton has gathered together a group of attractive poems on the outdoors. Interesting woodcuts are supplied by Miriam Atherton. The little book is privately printed and we are unable to find any indication of price.

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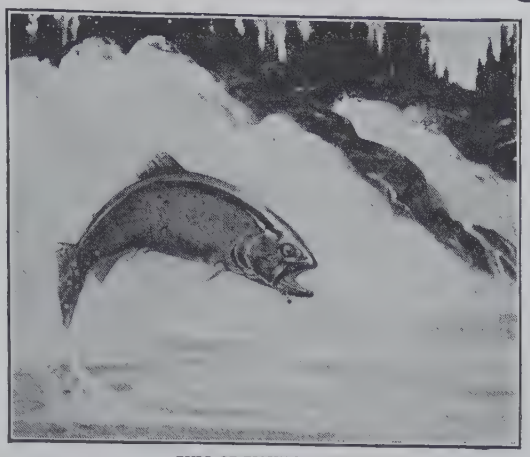

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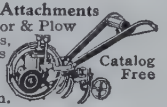

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Trees in Woodcut

An attractive book for the tree lover is that entitled *Trees*, the joint work of Margaret Whittemore and Edna Becker. Miss Whittemore has done a series of fourteen charming woodcuts and Miss Becker has caught the spirit of these in accompanying verse. The publisher is Bruce Humphries, Inc., and the price two dollars.

New Cornell Leaflet

Heat is the title of the latest Cornell Rural School Leaflet, and it is a fascinating assemblage of information ranging from the heat generated by friction to the heat provided for her eggs by a mother wood thrush. In this leaflet one gets a more comprehensive picture of the importance and characteristics of heat than we have seen presented elsewhere in compact and popular form.

Back-Yard Zoo

Although Daniel Pratt Mannix is only a senior at the University of Pennsylvania he has already acquired a considerable experience as a zoo director. Ever since the earlier day when his grandparents presented him with a pair of white rabbits he has been playing host to a variety of guests. That he has been a genial and understanding host is testified to by *The Back-Yard Zoo*, a collection of delightful stories of these guests. The stories were originally written only to amuse and not to add to zoological knowledge. Entertain, they do. Coward-McCann saw their popular appeal and they are now gathered in an attractively illustrated book by the above title. The price is two dollars.

Romantic Texas

In *Romance and Texas* R. A. Seele has gathered together a group of his interesting and informative articles on the Lone Star State and its natural history. Brought out in connection with the centennial of the State, this little volume provides an entertaining and varied picture of some of Texas' resources, from the buffalo to the bluebonnet, the State Flower. In its pages we meet the mockingbird and the road runner; the horned lizard and the trade rat; the grapefruit and the oil well. Mr. Seele has not endeavored to go into the history of Texas and weave in the significance of its natural resources in any orderly way, but, rather to stimulate interest through delightful little essays. The author is president of the Outdoor Nature Club of Houston, Texas, and copies of this book may be obtained from him at 1236 Rutland St., Houston.

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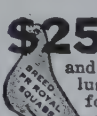

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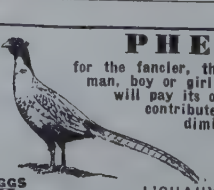

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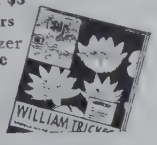

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One of the most fascinating books that has recently come to our attention is *Unrolling the Map* by Leonard Outhwaite. Here, between two covers, is the whole story of exploration; the romance of adventurous man penetrating into those misty places beyond the horizon. Starting with the early empires three centuries before Christ, this volume brings us down to the explorations of today with a word about those of tomorrow. As one turns the pages of this book one discovers knowledge of the world expanding, limits moving outward as the ripples move away from the spot where a pebble was dropped in the quiet waters. Beside the splendid text, the whole picture is graphically given in a series of fascinating maps on the face of which we see the darkness of the unknown replaced by the white of discovery. There is also an interesting series of drawings of boats, on which the majority of the explorers travelled as they searched the seas. Here, indeed, is a different volume, a valuable addition to any library. It is published by Reynal and Hitchcock and sells for $3.75.

Flora of Bermuda

Flora of Bermuda by Nathaniel Lord Britton and others, which was published by Scribner's in 1918, will henceforth be procurable from The New York Botanical Garden, Bronx Park, New York City, at the reduced price of $3.50. The book contains special sections on Mosses by Elizabeth G. Britton, Hepatics by Alexander W. Evans, Lichens by Lincoln W. Riddle, Fungi by William A. Murrill and Fred J. Seaver, and Algae by Marshall A. Howe. Dr. Britton, who was the founder and for 35 years director of The New York Botanical Garden, bequeathed the rights of this volume to the institution.

The Botanical Garden has also this month reduced the price of *A Text-book of General Lichenology* by Albert Schneider, published in 1897, to $2.50, and has added Britton's *Manual of the Flora of the Northern States and Canada* (second edition, 1907) to its list of books on sale, offering it at the accustomed price of $2.50.

Other books published and handled by The New York Botanical Garden include P. A. Rydberg's *Flora of the Prairies and Plains of Central North America* ($5.50) and H. A. Gleason's *Plants in the Vicinity of New York*—a simple key to the names of about 1500 species of plants occurring in the New York area. This will appear in March and will sell for $1.50.

Gentians on the Shore

"Perhaps to a Hoosier it does seem odd to find these gentle blossoms braving it on a wind-swept shore," writes Gertrude M. Grant of Detroit in comment on Dorothy Vestal's little story about gentians in the February issue, "but in Michigan it is the place we look for them! I have found them in just such colonies as she describes, all along the shore of Lake Michigan from Traverse City on the north. . . . The small blue blossom which Miss Vestal could not identify was in all probability *Lobelia kalmii*, a tiny relative of the cardinal flower which grows in profusion with gentians in such places."

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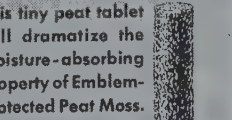

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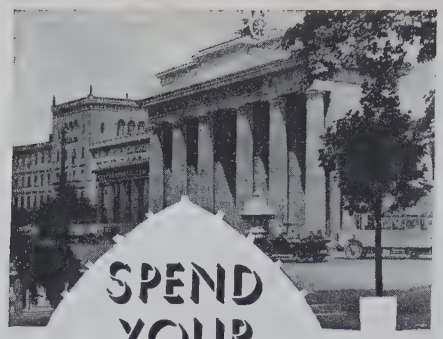

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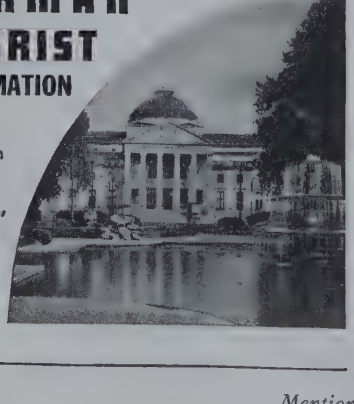

☆

Nature Study in Germany

Hugo Kalmbacher

(From the Annual Bulletin of the Toledo Field Naturalists' Association)

Nature Study is one of the most loved subjects among Germans. Still, in view of its early inception among monks and nuns during the Middle Ages, it seems strange that it was started as a regular study in Germany only about fifty years ago. Even then it was given only in a few universities. It was another ten years before it became a required subject in all German schools.

Today Nature Study manifests itself in two forms of organizations. The first of these is the "Wandervogel." There are thousands of this type of organization, and their members are the amateurs in the field of natural history. These groups center their activities around the week-end "hiking party." Groups varying in numbers from five to fifty assemble either on a Saturday noon or Saturday evening equipped with knapsacks and hiking sticks ready for a week-end in the open.

It is the policy of all German railroads to grant excursion rates on all trains to such groups. Members of a "Wandervogel" are interested in the study of natural history as a recreation, and the country is very anxious to encourage their interest. There are certain groups of the "Wandervogel" which make their trips along the various streams of the country using folding rubber boats. Two or three times during the year, on special holidays, the entire membership of the group make such a trip, but usually smaller groups make week-end trips of this type.

The other type of Nature Study society is purely commercial. There are three leading organizations of this kind in Germany: namely, Kosmos of Stuttgart, Koehler and Volkmar of Leipzig, and another one in the same city.

The writer was in charge of microscopes and slides for Kosmos during a period of five years, so he is best able to give details of the set-up of this organization although familiar with the other two.

Kosmos, the largest of the three, publishes a periodical by the same name well known in scientific circles all over the world. It has a subscription list of some 125,000. Another publication by this organization called "Microkosmos" deals with all phases of microscopy. In addition it supports a laboratory to which its members may send specimens for examination and identification. Another department publishes a series of books on natural history subjects. This society is the best known in Germany.

It is interesting to note that the large proportion of purchasers of natural science equipment is not among the students, as might naturally be suspected. Most of the purchasers are among the laboring classes, the small trades people and the like. For example, when Kosmos had a sale of microscopes in 1928, statistics were kept concerning the purchasers. These revealed the astonishing fact that three-quarters of the 2,080 microscopes sold were purchased by blacksmiths, carpenters, clerks, and those in similar walks of life. The average annual sale of microscopic slides was 1,200,000. In other words, natural history appeals to all classes in Germany.

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Nature Bibliography

Recognizing the great increase in Nature books issued during the past ten years, as well as the increase in interest in Nature and Nature literature, Dr. William Gould Vinal of the School of Education of Western Reserve University has compiled a splendid Nature Education bibliography. It is brought out in mimeographed form with 82 pages of titles grouped under humanized biology, animals, birds, gardening, insects, physical Nature study and the plant world, and is further subdivided in each classification. It is bibliography for the lay reader and books adapted for children and volumes handled in story form are so indicated in the listing. This bibliography is available from the School of Education for 75 cents.

Doubts Vinegarroon Biting

William C. Murphy, writing in approval of the article by Guy Van Duyn in our last September issue, says that "there must be a mistake in the letter (October, P. 195) written by Grace A. Shults in regard to her brother being bitten by a Vinegarroon. That must have been a Solpugid, as they are generally called Vinegarroon in this part of Arizona. We have never been able to find a Vinegarroon at an elevation as low as this, although we captured a number at Tombstone, which is about 5000 feet, and we have found them east through New Mexico." We are sorry if we have unwittingly maligned the Vinegarroon, and would be glad to hear further from our readers in the Southwest regarding the ranges and habits of any of these interesting Arachnids.

Bittersweet Culture

Our recent little note relative to the disappearance of bittersweet and resulting reduction in the normal food sources of berry-eating birds has brought to our attention researches being conducted at Michigan State College of Agriculture and Applied Science, East Lansing, Michigan, by J. A. Neilson. An experimental plantation has been made and a drive is being made to save from extinction some of the fine fruiting strains of this beautiful climber. Mr. Neilson is desirous of getting in touch with any individuals who know of such strains. He also interestingly discusses the bittersweet problem in an article in *Horticultural News*, published quarterly by the Michigan Horticultural Society.

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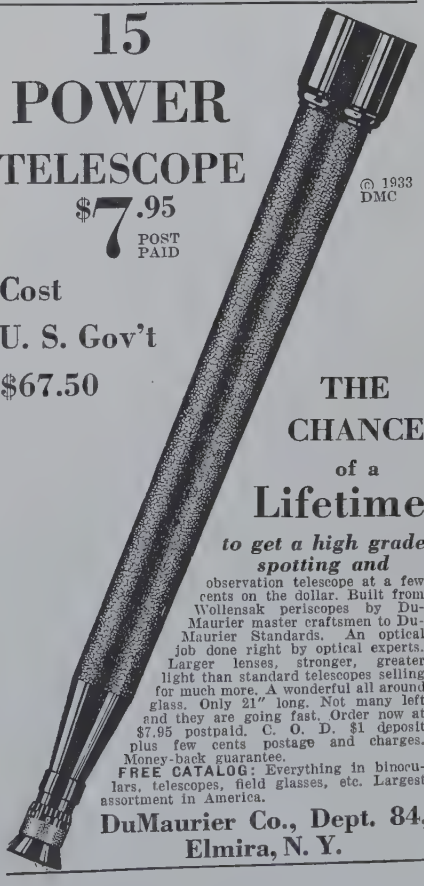

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PINE SQUIRRELS
By Jack Richardson

While camping in mid-August under some huge Engelmann spruce trees by the creek in Boulder Canyon, near Boulder, Colorado, I spent a morning watching the pine squirrels. Early in the morning, I was awakened by falling cones all about me and I soon found that they were being cut from the tops of the spruce trees by the pine squirrels. This continued during the first two hours of the morning, then the squirrels began to carry away the cones which they had cut and let drop to the earth. They carried them across the creek, crossing on the rocks which served as stepping-stones, and disappeared in the woods on the other side. I hid in the woods and watched them as they buried them in the hundreds of holes that they had dug under the trees. They would put the cone in the hole and then ram it farther with their front feet, and then go for another. It took about one minute to make a round trip. Every once and a while they would stay longer then usual and then I noticed that they were digging a new hole. I examined some of the holes and found that they went straight down for about five inches and then about six inches horizontally. The holes contained from thirty to seventy-five cones, and were carefully covered and the earth packed on them firmly.

While watching the squirrels, I also listened to the different noises that they made while they worked. A loud rattling B-r-r-r-r-r which sounded like an alarm clock was used to express a scolding note or expression of alarm or surprise. Another common call was a coughing his-sic-his-his-hic.

Cannibalistic Crickets

The mole cricket, an insect that looks like a field cricket and acts like a mole, is a serious pest in many cultivated fields of the South. These crickets are cannibals. At the end of any mole-cricket fight the victors devour the vanquished. These crickets also feed on smaller insects and other animal life, which leads them to frequent the edges of streams, ponds, ditches, and depressions where sediment is deposited as water evaporates. Insects and other low forms of animal life concentrate in such places, offering the mole cricket a varied animal diet.

Information on the mole cricket's food preferences will serve as a basis for more effective control measures, say entomologists of the United States Department of Agriculture. These crickets should be controlled, not because they feed on crops like most other insect pests but because they burrow through the soil like the common ground mole, uprooting seedlings and allowing air to enter the ground and dry out the roots of the plants not uprooted.

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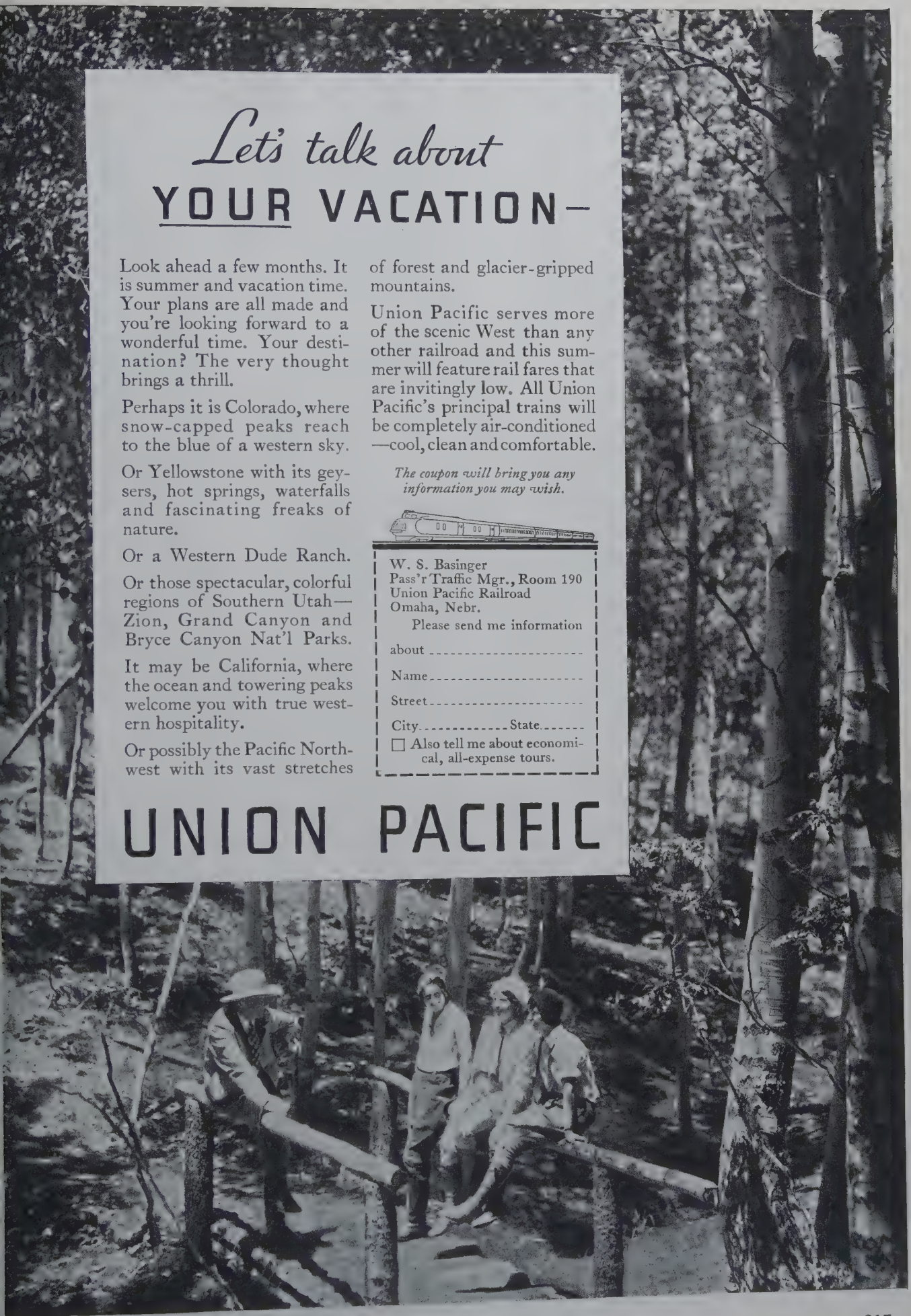

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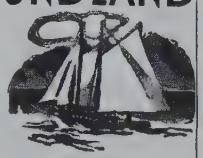

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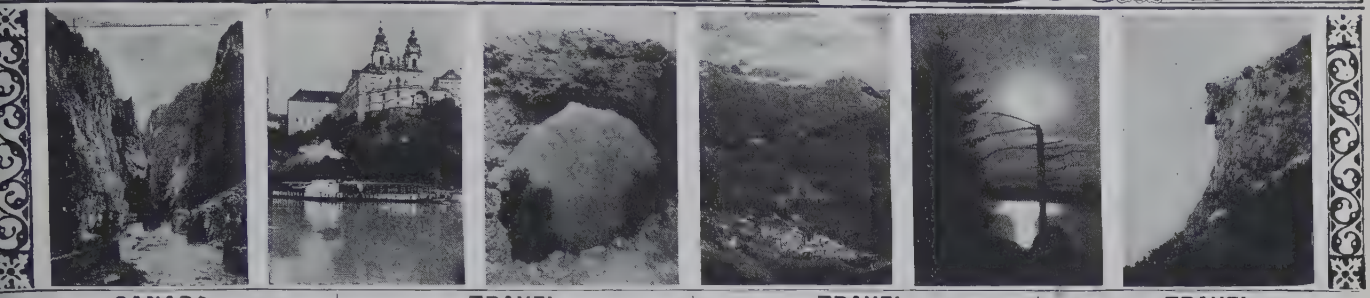

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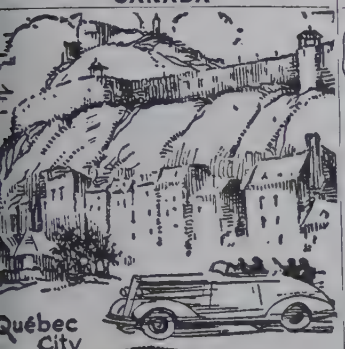

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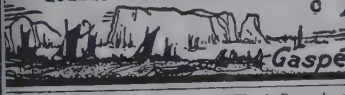

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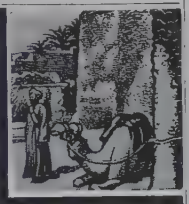

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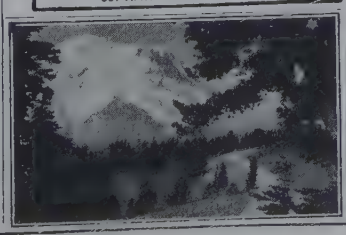

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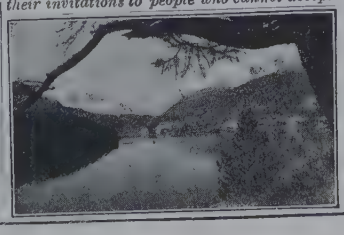

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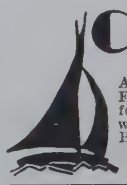

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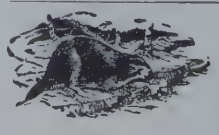

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SUSQUEHANNA

For Boys 6-18. On Private Lake in Susquehanna Mountains, New Milford, Pa. 17th Season. *Unlimited horseback riding*, under expert supervision, is *included* in fee. Other interesting land and water activities. Personal development is paramount. Telephone INdependence 3-3029. For illustrated catalog write Robert T. Smith, Malba, Whitestone, L. I., New York.

MOTHER: I made a mistake with my first daughter. Her first extended period away from home was in her fifteenth year when she went to boarding school, and I can tell you she had a hard time acclimating herself to her new friends. I have found that learning to mix with other girls is something which must be started early, and my second child is not missing the opportunity. When she goes to boarding school she will have lived with other girls at camp, and will enter boarding school with friends.

SON: I hate to be away from Dad during the summer, but his vacation is such a short one, and when he goes back to the city I have no one to play with but sister. I want to be with a bunch of kids my own age at camp. Why doesn't Dad take his vacation during the weeks before or after camp?

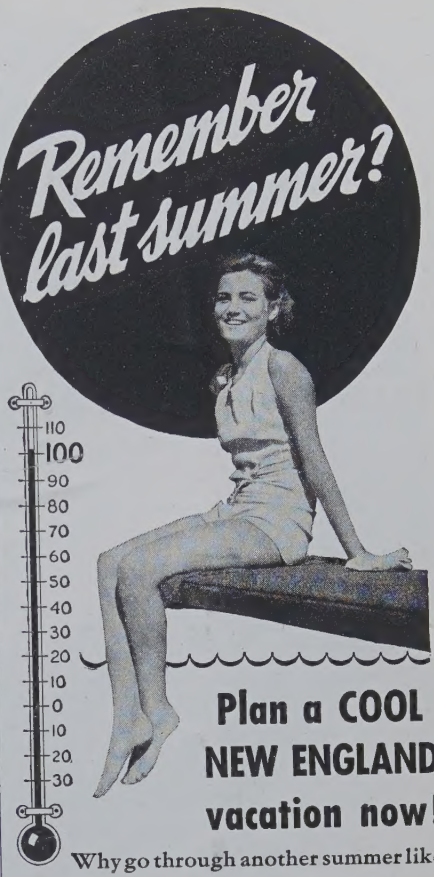
DAUGHTER: I guess they didn't have camps when Mother was my age, because she doesn't seem to enjoy doing the things which we do at camp. Bridge may be all right for the grown-ups, but I want to sail, ride horseback, learn some of the crafts, and most of all be with my crowd that goes to camp.

THE DOCTOR: I advise camp for the children of my patients, and I find that most of my colleagues do the same. The regular life at camp brings the children back home in the pink of condition. During the other months of the year I see a great many sick children, but you seldom hear of one sick in camp, or even during the months after camp. They build up a resistance which lasts for a large part of the school year. Of course this eats into my practice, but we practitioners are not such a selfish lot after all.

THE SCHOOL TEACHER: For years I wasn't sold on the idea of camp for boys and girls, but this was my fault. At camp the counsellors are called by their first names, and there is a certain familiarity between them and the children which we have never had in school. At first it seemed to me that camp children were fresh when they returned to school in the fall, but now I can see that this isn't freshness at all but a most admirable quality. I have changed my relation and have tried to be more like a camp counsellor. As a result, I know my pupils much better, and I find that they enjoy my classes and are accomplishing more work. I even think that I ought to have the experience of being one of their counsellors during the summer. What a joy it would be to teach children in such an intimate environment.

GRANDMOTHER: I may be old fashioned in some ways, but I know that most children of today aren't learning the things which Granddad and I learned on the farm. My grandchildren can't go back to the farm, but they can go to camp and have many of the same advantages. My income isn't such a large one but I'm always glad to furnish the tuition for the children. I would rather give them presents of this sort than the luxuries of their winter activities.

THE MINISTER: In spite of their lack of theological training, these camp directors seem to impress spiritual thoughts into children in a most gratifying way. I only wish I could secure such undivided attention and such obvious devotion as these children display at their camp services and camp fires at night.



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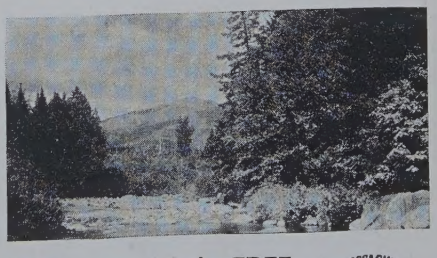

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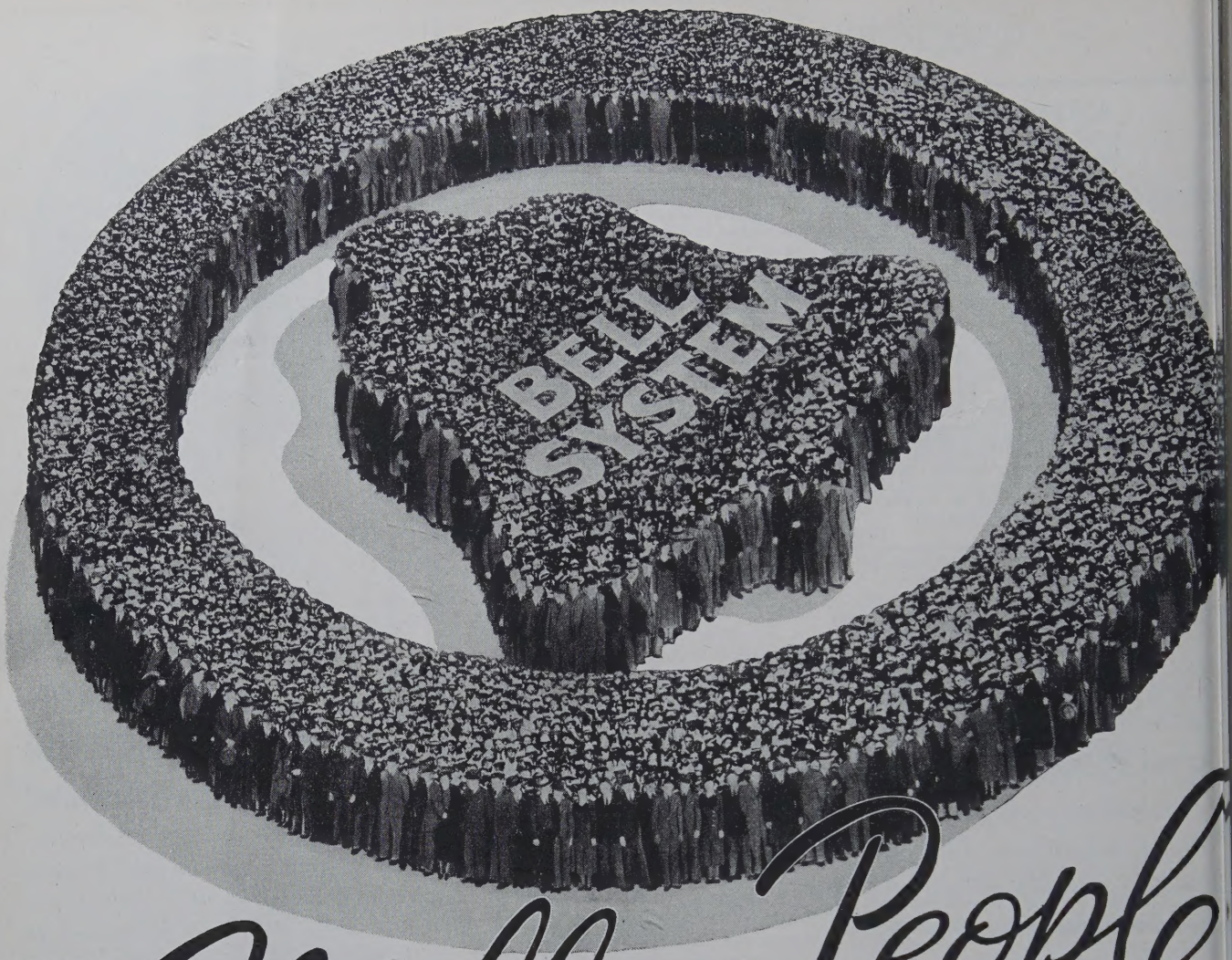

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BELL TELEPHONE SYSTEM

In The Month of May

ONE who knows the outdoors will make his own appointments in May. From year to year he remembers. For him there are 31 May-days. He needs not to be told what to see, what to listen for, or what the fragrances are

Wherewith the seasonable month endows
The grass, the thicket, and the fruit-tree wild.

Now even the casual attendant has little need for program notes on the pageants of Nature. He needs only a word in the ear: "Attend!" If he looks, he cannot help but see. No straining of ears to hear the music, no effort to catch the fragrance of blooms, no difficult adjustments to sense that all living things are in love! More significantly than ever "the kingdom of God is at hand."

This is the month of life abundant—life a-bounding, leaping forth. The essence of the meaning of the name itself is "to grow," a meaning known to all through associations and to scholars by researches into the origins of words. As distant as the origin of the name are the beginnings of celebrations on May-day, the gay new advent of life an occasion for liveliness and gayety, customs in a sense perpetuated today by playful observances in some communities. And after the blooms of May become profuse they grace memorial ceremonies on Decoration Day.

But Nature's celebrations are those we most wish to attend. The trees and flowers in bloom, the birds in song, the insects in almost ceaseless activity, the frogs in good voice, and the mammals in renewed life are inexhaustible sources of interest and delight and revelation.

No matter how easily one forgets to think of trees as plants during the rest of the year, he cannot fail to notice their blooms in May. The time for the blossoms of the buckeye has come, and the branches of these trees are heavy with their panicles of showy yellowish or greenish flowers. It is blossom time in the orchard, too, and the trees there are "seas of bloom and soft perfume and sweet perfume." Other trees are putting forth flowers—the flowering dogwood, the choke cherry, the sugar maple, and God's plenty to add. Every leaf has, in fact, the aspect of a bloom—the red young oak leaves replacing their predecessors that have rustled through the storms of winter, expanding and revealing a new color, of lavender, and then changing to light and to darker green; the crinkly little alder leaves; the wondrous bundle of infant leaves wrapped neatly in the beechen bud; and the shapely young maple leaves that will take on their most resplendent hues in autumn frosts to come.

Nearer the ground are the flowers more often noticed, as we walk with eyes to earth—though fleecy clouds traverse clear blue skies! But the downcast eye, too, will start with beauty in May if it catches sight of the trailing arbutus, the "Mayflower," hidden in a mossy, rocky place. A little higher the azalea, or wild honeysuckle, tempts the bees to dust themselves on its anthers or displays itself to boys looking for Decoration Day flowers. Violets, too, are about in May—birds'-foot on hillsides, downy yellow violets in shady woods, and in meadows the blue-flowered and the flecked white ones. There is no flora like the flora of May—rue anemone, columbine, jack-in-the-pulpit, rhodora, daisy, buttercup, nodding trillium, arethusa, and near the end of the month the modest dwarf Solomon's seal.

From tree-tops in the heavens, from lower shrubs, and up from the very ground itself, through all this enlivened world of bloom and fragrance, come the songs of birds returned once more to their nesting places or moving toward more suitable regions to the north. Back from Nicaragua, or somewhere south to Peru, the wood pewee in the canopy above is making its song in a minor key. The bobolink has returned from its winter sojourn in central South America and, its breeding plumage renewed, bubbles its name in song from a bended weed in the field. Scratching in dead leaves on the ground, the white-throated sparrow is singing the last plaintive strains that will be heard from this bird in the southern parts of its range until fall. On the breeding grounds others of its species have already begun the summer-long days of sweet singing—along the mountain sides of Northeastern States or farther north where most appropriately it seems to sing "Sweet Canada." More wildly, more joyously the Baltimore oriole and the house wren are whistling and warbling, and the breezes carry the music of dozens of other birds that are glad to be alive and in love in May.

It is the month of all months to
Go forth under the open sky, and list
To Nature's teachings.

HIS PERCH WAS THE WOODPILE, OVERLOOKING A PANORAMA OF BLUE MOUNTAINS AND SILVER LAKES, BUT COKE INVARIABLY SAT WITH HIS BACK TO THE VIEW